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LEGISLATION RELATED TO THE EYE

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for the Prevention of Blindness, Chicago

Federal and state laws are necessary weapons in waging a winning fight against blindness.*

IT is indeed fortunate that public demand spurred on by voluntary agencies encouraged Congress to establish the National Institute of Neurological Diseases and Blindness in 1950. This is the youngest of all the National Institutes of Health. For the initial period of planning and staffing in the years from 1952–1954 an appropriation of $1,250,000 was made. In 1954 the first direct appropriation for carrying on its work was $4,500,000.

With an increased appropriation of $9,861,000 for the years 1954–1956 the Institute launched an attack on specific vulnerable areas in the field of neurological and sensory disorders. During this period it successfully organized a cooperative and collaborative project with the National Society for the Prevention of Blindness and 75 outside investigators in 18 different hospitals. This research has given us the means of preventing retrolental fibroplasia—the disease which in a short span of 10 years had become the major cause of infant blindness, and which now is well on its way out.

Unified Effort

Appropriations of this kind come about only because members of Congress are informed of the need, and keeping them informed is a continuing and painstaking effort. Most of the major health agencies banded together to present a unified and effective appeal. Witnesses chosen to give testimony were carefully selected not only as to their professional qualifications or prominence as informed lay citizens, but with the definite purpose of having their testimony impress key members of the Congressional committee. One ophthalmologist who admirably presented the case for eyes not only was a key man in his field, in favor with his colleagues, but also was a constituent of the chairman of the sub-committee. In a particular instance our Society made a definite effort to encourage persons known for a conservative Republican point of view to communicate with a particular subcommittee chairman, asking for his full and enthusiastic support. It was well known that these were the communications to which he would give the most consideration.

For the fiscal year 1957 Congress appropriated $18,650,000. The Institute is currently working on such blinding diseases as uveitis, glaucoma and those affecting the retina. The total population in America affected by neurological and sensory disorders is around 20 million. Of this number blindness has already claimed 334,000.

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, April 8, 1957.

This year at least 27,000 will be newly blinded, half of this number by disease.

The voluntary health agencies, with their knowledge and ability to inform the public and to secure public action, have made the National Institute of Neurological Diseases and Blindness a reality. A strong program characterized by a teamwork approach is at last being carried forward with Federal funds in the field of eye research, teaching and training. This can be maintained and expanded only through the continued efforts of an informed citizenry willing to make their wishes known to Congress. Here is an area in which all prevention of blindness agencies can help, and it is important to remember that eye research is of so complicated a nature that voluntary gifts cannot do the job alone.

Certification of Blindness

Until a few years ago certification of blindness under the Social Security Act was limited to "physicians skilled in diseases of the eye." A series of unfortunate circumstances led to an amendment which now provides for this certification by "physicians skilled in diseases of the eye or by an optometrist." Provision for optometric skills should and could be provided under the Social Security Act. A satisfactory amendment was agreed upon by representatives of prevention of blindness agencies, ophthalmology and optometry in place of the proposal which is now written into the Act. All efforts to secure the amendment failed. The diagnosis of blindness is often a difficult task for an ophthalmologist. Even he may have to call in other experts. The Social Security Act as it now stands does not provide for proper use of optometric skills and from the standpoint of prevention of blindness means that patients examined by an optometrist should also have an ophthalmological examination. Only a medical eye specialist is qualified to render any opinion concerning restoration of sight.

Here is an opportunity for prevention of blindness agencies, ophthalmology and optometry to work together for the good of the people they serve. In 1952 such cooperation in Illinois secured the passage of an up-to-date optometric practice act. Optometry alone had been working for many years unsuccessfully to achieve this goal. The Illinois Optometric Association drafted the proposals and presented them to medicine and to the Illinois Society for recommendations and approval. To date, corporate practice and price advertising are still a matter of concern, for previous combined efforts have not been able to defeat the strength of the opposition.

Glasses Over the Counter

Over-the-counter sale of eyeglasses is a bad practice for it keeps many persons who are having trouble with their eyes from getting professional eye care in time. Only a few states have laws which prohibit this type of sale, but here is a specific area in which eyes could be safeguarded from the ignorance of their owners. How many of the people who try to find glasses by a trial and error method at a serve-yourself counter are losing valuable time? How long will it take to protect the public from over-the-counter sales? Prevention of blindness groups should definitely support legislative efforts in this direction. There is powerful opposition, but with the cooperation of medicine and optometry as well

perhaps a convincing story can be presented to state legislatures in spite of the opposition.

Advertising Standards

In the field of advertising certain eye safeguards are necessary. Labels on some cosmetics, insecticides, cleaning fluids, etc., warn the user not to get the product in his eyes. Oftentimes this warning is in print so small a magnifying glass is needed to read it; but even if it is read, a warning about what not to do is hardly enough. Instructions as to what to do in case of contact with the eyes are most important. Federal control along these lines is indicated if the product does not already come under the Pure Food and Drug Act. Surely, no hardship or additional expense would be placed on the manufacturer.

Another trend in advertising which objectionably invades the eye field is evident in relation to items like the needle threader with a magnifying glass. Lead line: "Saves Eyes—Saves Time." Saves time, yes—but what has it to do with saving eyes? If someone started a collection of all the misleading "save your eyes" advertising, he would have proof of the need for a Federal provision to safeguard the public in this respect, if this does not already come under the jurisdiction of the Federal Trade Commission. Manufacturers and advertising experts are not deliberately trying to mislead. They simply do not have the facts. There appears to be no way adequately to handle the problem through an advertising code of ethics or manufacturers' agreement; there are too many different authorities to reach.

What about the boy with a gun, an arrow or a similar item with which adoring relatives and friends—even parents—provide their children? Our greatest defense against these, I believe, is education. First, education of adults not to buy and, second, if they must be purchased, strict supervision of children in their use. Many so-called toys are a grave danger to eyes, and some states have already attempted to prohibit or control their use. For instance, Rhode Island prohibits sale to minors under 15 of machine gun, pistol, rifle, air rifle, air pistol, blank gun, BB gun, or other instrument from which steel or metal projectiles are propelled; also possession or use of same by such minor except in the presence of an adult on an approved rifle range or when carrying to or from such range in a case and unloaded.

The National Rifle Association believes that children should be taught marksmanship and gun safety. A local ordinance drafted by them is aimed at control of sale, possession and use of rifles except on an approved rifle range. The National Society for the Prevention of Blindness points out that this model ordinance is fine as far as it goes, but it just does not go far enough.

Fireworks Legislation

The National Fire Protection Association called experts together to draft a model fireworks law which could serve as a guide to state legislatures. Such control is now in effect in 28 states. Local ordinances simply did not work, and experience has taught us that state laws attempting to control fireworks even needed the teeth of a Federal law.

Fireworks have always been a grave danger to eyes. In 1942 the first real progressive fireworks control became

effective in Illinois through the work of the Illinois Society for the Prevention of Blindness, but sparklers remained a legal item. It was not until after the end of World War II that the Illinois fireworks law was given a stiff test. In 1946 the American Medical Association discontinued collecting fireworks statistics because it was believed the problem was solved. All our evidence indicated it was not, and so the Illinois Society began collecting its own statistics from hospitals, medical eye specialists, pediatricians and newspapers. The Illinois Society also worked hard to carry on an educational campaign in an effort to secure public understanding and effective enforcement. But all around illegal fireworks purchased by mail were continuing to injure children—to damage eyes. It was apparent that only an Act of Congress could put a stop to the violation of state fireworks laws. Impetus for Federal action was set off by horrible tragedy and death in Waukegan in 1951, and spurred on by more tragedy and death in Chicago in 1952. Today the needed Federal law is well in force. Twenty-eight states limit all fireworks celebrations to supervised public displays. In other states action may be lagging because no one is collecting fireworks statistics.

Fatalities from Sparklers

In Illinois we thought sparklers were out with legislative action in 1953, but the Illinois Supreme Court rendered a decision on a suit brought by fireworks interests that sparklers could be sold. So since April 19, 1955, sparklers have been with us again. It is interesting that in 1954, when sparklers were illegal, sparkler injuries were reduced to eight for the whole state. The hypnotic beauty of sparklers burning at high heat—1650 degrees Fahrenheit—misleads some adults—manufacturers and others—to think that children should not be denied them, even though the children may be sent into the hospital with painful second and third degree burns, with eye injuries, and even to a flaming death. As far as we have been able to determine, in Illinois in 1956 this single toy used for the same celebration accounted for a minimum of 20 accidents serious enough to send 20 children literally on the same day to pediatricians, ophthalmologists and into hospitals for treatment of serious burns—and one child to her death. Further, in the last six years seven of our 11 Illinois fireworks deaths were caused by sparklers. There are many types of toys which give us concern. But is any potentially more dangerous than a substance made to burn at heat as high as steel snaking down the cooling bed of a hot mill; and one that, after the sparkling beauty of the flitter is gone, leaves a steel core hot enough seriously to sear wood or flesh or set clothing afire?

Fireworks are more easily controlled than most toys because they represent a single unit. The solution to their use is a simple one—taking them out of amateur hands and having bigger and better fireworks through supervised public displays in the hands of pyrotechnical experts.

Control of Ophthalmia Neonatorum

An excellent example of what state laws can accomplish in preventing blindness is the mandatory silver nitrate law. For example, in Illinois, after a four-year battle, such a law was passed in 1933. From 1933 to 1944

seven Illinois babies were blinded at birth from ophthalmia neonatorum. Based on previous annual experience, Illinois could have had 200 to 250 babies so blinded in this 10-year period. Not one Illinois baby has been a victim of this type of blindness since 1944. The country as a whole reported a 99 per cent decrease in 1954. Less than the mandatory law simply did not work in Illinois, but it was not just the law that did the job. It was its effective enforcement, achieved through a concentrated job of education, through making the precious prophylactic drug readily available, and through a careful check to find violations, with follow-through on every one. The Illinois Department of Health and the Illinois Society collaborated well, and the results certainly speak for themselves.

Trachoma Campaign

Trachoma is another example of what can be done to eliminate a communicable eye disease. In 1935 trachoma was prevalent in southern Illinois, and it was the reason for many persons being on the blind relief rolls. Work done by the Illinois Society proved that a job of case-finding, proper clinic facilities for treatment, and transportation to get the patients in for treatment, were effective in fighting the disease. Once the demonstration by the Society had proved itself, it was possible to persuade the state legislature to appropriate necessary funds to carry on the work. All of this started about 1935, and by 1950 Illinois had the first year in which no new trachoma case was reported for the state. That good record has been held in the ensuing years. The clinics still see some of the old cases and today serve other persons in need of eye care who cannot afford private medical services.

Drivers' Vision

Tests for drivers' licenses offer an opportunity for promoting eye health and care. As drivers ourselves and as pedestrians we have a real concern about the issuance of drivers' licenses. As prevention of blindness workers we have an additional concern about eyes. State laws vary in regard to the requirements for holding a driver's license. Experts in other fields are at work to obtain more rigid and uniform standards. Certainly a qualified professional committee at the national level should spell out the requirements and standards for vision as well as the kind of eye reports acceptable to pass this portion of the test and for renewals of licenses. Such recommendations could serve as a guide for each state which in turn should have its own professional committee. This professional committee would do well to have official appointments from the professional societies concerned.

Desirable legislation from the standpoint of eyes covers a vast field. It is one of the fronts on which the battle against blindness must be waged and one for which we can find many different allies.

Benjamin Franklin on Editorial Policy

"It is likewise as unreasonable what some assert, *That Printers ought not to print any Thing but what they approve;* since if all of that Business should make such a Resolution, and abide by it, an End would thereby be put to Free Writing, and the World would afterward have nothing to read but what happen'd to be the Opinions of Printers."

GLAUCOMA DETECTION

in Private Practice and Hospital

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The chief value of glaucoma surveys is educational; their ultimate aim should be the inclusion of tonometry in every physical examination in the over-40 age group.*

GLAUCOMA is a major cause of blindness in the United States. Its blinding potential, however, can be greatly diminished by early diagnosis and treatment. The importance of early recognition was first highlighted by Brav and Kirber[1] and has since been emphasized by Wolpaw[2], Zeller and Christensen[3], Gundersen[4], and Vaughan et al[5].

The aim of the glaucoma detection program here reported was to demonstrate the need for ophthalmologists, and all physicians giving general physical examinations to patients over 40 years of age, to include tonometry in their examination routines. The series was compiled from three categories of patients: private patients of ophthalmologists; hospital inpatients; and patients seen at the University of California Eye Clinic. All 7,943 were subjected to tonometry and ophthalmoscopy, and when practicable also to tonography, visual acuity and visual field measurements, and glaucoma provocative tests. All were 40 years of age or over, and in none had glaucoma been previously detected.

The tonometers were standardized at the University of California Hospital Tonometer Testing Station. All patients with elevated tonometric readings were given visual field examinations. Through the courtesy of Dr. David O. Harrington and Dr. Milton Flocks, their Multiple-Pattern Field Screener[6] was used in these field measurements in the Agnews series. Typical defects were found in the majority of cases. This method of field testing was performed more easily and quickly than the standard method and the results corresponded satisfactorily with those obtained on different days by means of the tangent screen.

The criteria for diagnosing glaucoma in this study were an abnormally high intraocular pressure, plus one other positive finding, e.g., a nerve fiber bundle visual field defect, glaucomatous cupping of the optic disc, below normal facility of aqueous outflow, or a definitely positive provocative test. A patient was classed as a glaucoma suspect if he had a slightly elevated intraocular pressure in the absence of other signs of glaucoma.

* From the Department of Ophthalmology, University of California School of Medicine, San Francisco. A project supported entirely by a grant from the National Society for the Prevention of Blindness.

TABLE I

Results of Glaucoma Detection Survey of 7,943 Patients

Patient Category	No. Examined	No. Detected	Per Cent	No. Suspects
Group I				
Private Patients				
Dr. Shaffer	4,000	94	2.1	0
Dr. Vaughan	1,528	28	1.9	0
Group II				
Hospital Inpatients				
Univer. of Calif. Hosp. San Francisco Co. Hosp. U. S. Veterans Hosp.	838	3	0.36	19
Group III				
Clinic Patients				
Univ. of Calif. Eye Clinic	577	16	2.8	14
*Group IV**				
Hospital Inpatients				
Agnews State Hosp.	1,000	19	1.9	14
Totals	7,943	160	2.01	47

* Previously reported[8]

Table I summarizes the results of the survey according to the source of the patients examined.

Group I. In the first group, drawn from the private cases of two ophthalmologists practicing in different cities, an unequivocal diagnosis of glaucoma was made in 122 patients (2.01 per cent), all of whom are now under treatment. There were no glaucoma suspects in this group, probably because the doubtful cases could be checked and rechecked until the diagnosis was certain. This was in sharp contrast to the considerable number of suspects among the hospital and clinic patients, many of whom never were seen after the initial examination.

Group II. The hospital patients in Group II were inpatients on the medical services of the University of California Hospital, the San Francisco County Hospital and the U.S. Veterans Hospital, San Francisco, and inpatients on the gynecology service of the University of California Hospital. Of the 838 patients examined, only three (0.36 per cent) were found certainly to have glaucoma, but an additional 19 were regarded as suspects. The reason for the relatively low incidence of previously undetected glaucoma found in this group is debatable. One possible explanation is that they were for the most part debilitated patients with physiological mechanisms incapable of producing significant elevations in intraocular tension. It is also possible that patients at rest are less likely to develop chronic wide-angle glaucoma. On the other hand, acute narrow-angle glaucoma is a well-recognized clinical entity among hospital patients, especially if they are under considerable stress. A more important factor is probably the relative-

ly large number of glaucoma suspects. If these doubtful cases could have been studied properly, a significant number would very likely have been diagnosed glaucoma.

Group III. In the University of California Eye Clinic tonometry in patients over 40 years of age has long been part of the routine eye examination. In 577 such patients seen consecutively in this clinic over a period of six months 16 cases of previously undetected glaucoma (2.8 per cent) and 14 glaucoma suspects were uncovered. As in the hospital inpatient group, the number of suspects was relatively large, probably because they could not be followed sufficiently for the requirements of unequivocal diagnosis.

Group IV. The patients in this group were examined in a previous glaucoma detection survey at Agnews State Hospital, the results of which have already been published[5]. The incidence of glaucoma uncovered in this group of inpatients was much greater than it was among the inpatients in the various San Francisco hospitals, possibly because the Agnews Hospital patients were in more or less permanent residence so that suspicious cases could be re-examined and the diagnosis of glaucoma ruled out or confirmed in a larger number of instances.

When the findings in all groups, including the Agnews State Hospital group, were totaled, the percentage incidence of previously undetected glaucoma for the entire series of 7,943 patients was found to be 2.01 per cent. So far as we know no other glaucoma survey has been carried out on a comparable series of patients. There is no basis for statistical comparison, therefore, but the incidence of 2.01 per cent may be regarded as consistent with the generally accepted national average incidence of from 1.5 to 2.0 per cent that has been based on spot checks of industrial workers and other groups.

A statistical comparison can be made, however, between the results of these glaucoma detection surveys and the surveys that have been made on two other diseases with insidious onset, tuberculosis and cancer. The detection rate in these three diseases, per 1,000 patients examined, is as follows:

	Cases Detected per 1,000
Glaucoma	20
Tuberculosis[7]	1
Cancer[8]	4

It is apparent from this comparison that the ophthalmologist has an exceptional opportunity to practice preventive medicine. Those in search of tuberculosis and cancer go into the field with elaborate diagnostic devices to find only one victim in every 1,000 individuals examined. Ophthalmologists, by means of relatively simple diagnostic tests, can expect to uncover from 10 to 25 cases of glaucoma in every 1,000 patients they see within the comfortable confines of their own offices.

DISCUSSION

The chief value of glaucoma surveys should be regarded as educational; i.e., the statistics derived from them present the glaucoma problem in convincing terms to both colleagues and patients. The ultimate aim should be to persuade medical leaders in medical schools, the military and industry that tonometry should be included as part of every physical examination in the

over-40 age group. When this has been achieved glaucoma surveys will no longer be necessary.

Many of the procedures followed in routine physical examinations are so outmoded as to be more ritualistic than useful; not so tonometry.

The fundi of the 7,943 patients in this series were also examined and it is noteworthy that not a single fundus condition was uncovered that required any immediate treatment.

The higher degree of cooperation obtainable from private patients made the unequivocal diagnosis of glaucoma among them vastly easier than among clinic patients. Since this survey was concluded the employment of a full-time administrative assistant on the glaucoma service of the University of California Medical Center has greatly improved this clinic patient situation; one of the assistant's duties is to keep track of the glaucoma suspects and to call in any glaucoma patients who fail to return regularly for examination and treatment.

SUMMARY AND CONCLUSIONS

1. In a glaucoma detection survey of 7,943 patients over 40 years of age, glaucoma was discovered in 2.01 per cent. The majority were patients visiting the private offices of ophthalmologists. A lesser number included inpatients in four hospitals, and patients visiting the University of California Eye Clinic.

2. Tonometry is a valuable procedure in preventive medicine and should be part of the routine physical examination of all individuals over 40 years of age.

ACKNOWLEDGMENTS

We wish to express our appreciation for the valuable assistance and cooperation given us during this study by Frederick C. Cordes, M.D., professor of ophthalmology; Henry D. Brainerd, M.D., professor of medicine; Herbert F. Traut, M.D., professor of obstetrics and gynecology; Edward C. Hill, M.D., assistant professor of obstetrics and gynecology—all members of the staff of the University of California School of Medicine; by Charles B. MacGlashan, M.D., Carleton E. Van Arnam, M.D., and Monte Holland, M.D., residents at the U.S. Veterans Hospital, San Francisco; and by Mrs. Vernon Keithley, R.N., San Jose, California.

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"Glaucoma," an 8-page pamphlet for the patient, is available from NSPB. Pub. No. 6. Price, 5 cents.

Retrolental Fibroplasia in New York State

A follow-up report for 1956 from the New York State Department of Health, Bureau of Maternal and Child Health, and the New York State Department of Social Welfare, Commission for the Blind.

RETROLENTAL fibroplasia, the disease that has blinded almost 1,000 infants in New York State during the past ten years, has continued to remain at a low level of incidence. Only three babies born in New York State in 1956 were reported as blind as a result of retrolental fibroplasia to the State Commission for the Blind in 1956. An identical number was reported in 1955. This is in marked contrast with the 52 cases reported in 1953 before limitations on the amount of oxygen given premature infants were generally adopted.

Only seven infants born in 1955 were reported as blind in 1956. By contrast 27 babies born in 1954 were reported as blind the following year. The rise and decline of this disease in New York State from 1946 through 1955, and a more complete account of the state's experience and program through that year has been published in the *New York State Journal of Medicine*[1] and was reprinted in the Summer 1956 issue of the *Review*.

All three cases born and reported in 1956 were very small premature infants weighing two-and-a-half pounds or less at birth. In contrast to previous years when oxygen was often administered on a routine basis to premature infants, the cases reported in 1956 had all the clinical manifestations of severe respiratory distress including rapid shallow breathing, apnea, and cyanosis. One baby received continuous oxygen for 31 days; oxygen concentrations recorded q. 8 h., ranged from 35 to 40 per cent and none exceeded 40 per cent. Another received continuous oxygen for 17 days; five recorded oxygen concentrations ranged from 35 to 46 per cent, with two greater than 40 per cent. The third received continuous oxygen for nine days; oxygen concentrations were not recorded, but on the basis of the ordered liter flow and incubator model it is unlikely that concentrations exceeded 40 per cent.

Information collected in New York State in 1956 tends to confirm the experimental findings of Patz[2] and the experience of the United States Public Health Service cooperative survey reported by Kinsey[3]. It indicates that blindness can be produced by exposure to oxygen concentrations less than 40 per cent particularly if the exposure is prolonged and the degree of prematurity great.

The need of the small premature infant for oxygen in severe respiratory distress poses a severe dilemma to the clinician. It is possible that the three infants who developed retrolental fibroplasia in 1956 in New York State would not have survived without some help from oxygen. As has recently been pointed out, there is a particularly urgent need for data on the value or risks of oxygen during the first 24 hours of life when risks of death are highest[4]. The potential danger of

oxygen administration at any concentration cannot be minimized. However, in view of the life-saving potential of this therapeutic tool, its tolerance limits need more careful study than they have received thus far.

Previous reports have stressed the importance of controlling oxygen concentration when oxygen is administered to premature infants[5]. It is clear now that control of the duration of oxygen exposure (at any concentration) is also necessary if retrolental fibroplasia in premature infants is to be prevented.

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FOR INDUSTRIAL WORKERS

"It's Up to You" is the title of a new NSPB eight-page two-color folder with many illustrations, directed to the industrial worker. It sums up the leading eye safety practices and habits on the job, at home, in emergency; in planning, working for and enjoying a healthy, well-rounded and satisfying life. NSPB Pub. No. 29. Price, $7.00 per hundred copies.

FORD GRANTS IN EYE FIELD

The Ford Foundation announced in March payments to 3,300 private hospitals in its 200 million dollar program to improve and extend community hospital services in the forty-eight states, Alaska, Hawaii, and Puerto Rico. Grants to individual hospitals range between $10,000 and $250,000.

The program is an effort by the Foundation to help strengthen basic American institutions and to encourage wider public support of them. Many hospitals are operating without deficits only through curtailment or elimination of essential services. The grants are designed to help maintain or expand them.

Following is a list of eye hospitals and amounts of the total grants:

Los Angeles Eye and Ear Hospital, $10,000; Eye, Ear, Nose and Throat Hospital, New Orleans, $39,000; Maine Eye and Ear Infirmary, Portland, $42,300.

In Baltimore, Eye, Ear and Throat Hospital, $24,900; Presbyterian Eye, Ear and Throat Hospital, $10,000.

Massachusetts Eye and Ear Infirmary, Boston, $76,500; Newark Eye and Ear Infirmary, New Jersey, $24,100; Buffalo Eye and Ear Infirmary and Wettlaufer Clinic, New York, $10,000.

In New York City, Brooklyn Eye and Ear Hospital, $50,000; Bronx Eye and Ear Infirmary, $15,100; Harlem Eye and Ear Hospital, $10,000; Manhattan Eye, Ear, and Throat Hospital, $77,100; New York Eye and Ear Infirmary, $63,800.

Wills Eye Hospital, Philadelphia, $85,000; Eye and Ear Hospital, Pittsburgh, $58,400; Memphis Eye, Ear, Nose and Throat Hospital, Tennessee, $27,700; Houston Eye, Ear and Throat Hospital, Texas, $10,000; Hurst Eye, Ear, Nose and Throat Hospital and Clinic, Longview, Texas, $10,000; Richmond Eye Hospital, Virginia, $19,300.

Power Mower an Eye Menace

REPORTS of serious injuries to persons operating power lawn mowers are growing more numerous, and indicate the need for special safety measures.

The June 1957 issue of *Home Safety Review*, published by the National Safety Council, cites a survey made by the Accident Prevention Unit of the Georgia Department of Public Health in which questionnaires were returned by 463 physicians in that state. During the two-year period covered by the study 737 power lawn mower accidents, resulting in 794 injuries, were reported. Of these 553 were due to direct contact with the machine, and 241 were caused by objects thrown by the mower blade.

Dr. John N. McClure, Buckhead Clinic surgeon in Atlanta, who with several associates analyzed these accident cases, states that 39 involved the eye and 17 the head or neck, all caused by objects thrown by the blade. The victims of such missiles frequently were not the operators of the machines.

The number of eye injuries is considered to be extremely high in view of the small amount of body surface involved and low exposure to injury of this portion of the body. The need for wearing eye protection when operating a power mower is strongly emphasized.

Speed of Blade

The gasoline rotary type of mower was involved in the majority of these accidents. It is regarded as more dangerous, and more frequently used. Fourteen per cent of the injuries produced permanent disability.

Dr. Lytt I. Gardner, Syracuse, N. Y., pediatrician, observes in a recent issue of *Current Medical Digest* that the rotor-type power lawn mower has earned a secure place on the home accident list. A mower blade, he points out, travels at a speed of 314 feet per second, "uncomfortably close to the muzzle velocity of a 32-caliber Smith and Wesson revolver," and the likelihood of the mower making a secondary missile of any rock or metal object in its path should not be minimized. In addition to deep lacerations involving bone injury, and development of tetanus infection following such injury, Dr. Gardner reports on one youthful patient who lost an eye through puncture of the globe by a rock sent flying from a mower blade.

The U. S. Rubber Company plant at Joliet, Illinois, sponsor of a Wise Owl Club chapter, reports what is perhaps the oddest mower accident that has occurred. Two laborers on the company's grounds were cutting grass with hand-operated rotary power mowers. As one approached his idle machine to resume operations the second worker, a dozen or so feet away, made a turn with his mower. The blade struck and broke a rock which hurtled across the lawn into the first laborer's face.

Among suggestions on how to operate power mowers safely the National Safety Council advises: Wear eye protection. Wear foot protection, such as safety shoes. Inspect the lawn and remove stones, sticks, wire and other debris. Keep bystanders, children and pets at a distance. Never attempt removal of any object from the mower until the rotor has stopped completely.

PENICILLIN vs SILVER NITRATE

in Ophthalmia Neonatorum Prophylaxis

Scott T. Harris, M.D.

Beyer Memorial Hospital, Ypsilanti, Michigan

THE excellent cooperation of the medical staff and nurses at Beyer Memorial Hospital made possible an experiment in using routine one per cent silver nitrate solution and one per cent penicillin G. ophthalmia ointment in the eyes of newborn babies in the delivery room of the hospital from March 1, 1955 to February 29, 1956. This was carried out by the following method:

Alternate babies had one per cent penicillin G. ophthalmia ointment supplied by Abbott Laboratories used in their eyes in the delivery room.

Memoranda of which (silver nitrate or penicillin) was used were sent directly to the record room so that the personnel of the newborn nursery would not know which had been used.

Nurses in the newborn nursery examined all babies' eyes on the second and fifth days postpartum and marked the chart as follows:

0—No conjunctival reaction

†—Mild erythema of conjunctiva without discharge

††—Moderate erythema of conjunctiva without discharge

†††—Moderate erythema of conjunctiva with discharge

††††—Severe erythema of conjunctiva with discharge

It was soon found that such differentiation was not practical and three classifications had to be used:

1. No conjunctivitis
2. Conjunctivitis without discharge
3. Conjunctivitis with discharge

All conjunctivitis with discharge had smears and cultures made of the discharge.

Results

A total of 2,424 babies were treated; 1,219 received penicillin prophylaxis, 1,205 received silver nitrate. In this group there were a total of 74 reactions; 41 to silver nitrate and 33 to penicillin.

Twenty-seven or 2.24 per cent of the silver nitrate reactions were mild without discharge, and 14 or 1.15 per cent were severe with discharge. Of the penicillin reactions, 22 or 1.80 per cent were mild without discharge and 11 or 0.902 per cent were severe with discharge. Of the 25 cases with discharge all had smears and cultures taken. Only one showed bacteria on smear and in this case nothing grew on culture. This case revealed an atypical gram negative intracellular diplococcus. The physician in charge of the case took smears and cultures on all members of the family. He found no evidence of gonorrhea but treated the baby and all members of the family vigorously with penicillin. The conjunctivitis in the baby cleared rapidly and no other member of the family showed any evidence of gonorrhea.

It was difficult to follow the cases of severe conjunctivitis as they became scattered over a fairly wide geographical area. However, about two-thirds of them were followed to some extent

and half of these proved to be congenitally obstructed tear ducts.

Discussion

H. L. Ormsby has an excellent discussion of this whole subject in the *American Journal of Ophthalmology*, 39 (Pt. 2): 90–95, April 1955, with the conclusion that one per cent silver nitrate is as satisfactory as any of the newer drugs in the prevention of ophthalmia neonatorum and the results of this study bear out this finding. Statistically the difference between the groups is not significant.

Conclusion

A year's study of silver nitrate and penicillin on 2,424 newborn babies in the prevention of ophthalmia neonatorum reveals no advantages in the use of penicillin.

FREAK CASE OF LENS ABSORPTION

A rare case of spontaneous absorption of a lens and its anterior capsule 29 years after the development of a toxic cataract is reported by Dr. Norman Corin of Jamaica, N. Y. in the *AMA Archives of Ophthalmology*. Only five cases of this sort are on record, two of them in adults.

Dr. Corin first saw this patient, a woman of 45, in 1949, by which time she had had a cataract for 23 years in the left eye, with vision limited to light perception. Examination showed a mature complete cataract with no synechia. The visual acuity of the right eye was 20/20. On a second visit in 1952 the cataractous eye was unchanged.

In March, 1955 this eye became red and painful for several days, after which the patient suffered acute photophobia. On examination Dr. Corin found complete aphakia, with nothing remaining of the lens and capsule but fine, dust-like particles on the anterior face of the vitreous. These remained at the last reported examination in the fall of 1955. Tension in the eye was normal, and corrected vision was 20/20.

WILLIAM E. COTTER

William E. Cotter, counsel for Union Carbide Corporation, and a member of the board of directors of the National Society for the Prevention of Blindness, died in New York City on August 15 at the age of 64.

Mr. Cotter was long active in work for a varied group of educational and welfare organizations. He was a member of the advisory committee of the Graduate School of Business Administration and the School of Commerce, Accounts and Finance of New York University; also a trustee of the University's Law Center Foundation. Other groups which he served as a board member included Xavier University of Cincinnati, Albert Magnus College in New Haven, Fordham University and Notre Dame. He was active in the American Heart Association, the Greater New York Fund, the National Fund for Medical Education, and the Arthritis and Rheumatism Foundation.

Mr. Cotter was keenly interested in the National Society's program, to which he contributed much valuable advice and counsel. He will be greatly missed.

1958 NSPB Conference

The 50th anniversary of the founding of the National Society for the Prevention of Blindness will be celebrated at its next annual conference, to be held in Philadelphia March 12–14, 1958. The headquarters will be the Bellevue-Stratford Hotel.

It is suggested that those who plan to attend make their reservations directly with the hotel well in advance. A block of rooms at minimum rate has been set aside for the conference.

Ophthalmology in Alaska

DR. H. R. LEER, one of five ophthalmologists practicing in Alaska, contributes an interesting article to the January 1957 issue of the *Eye Digest.* Over twice the size of Texas, Alaska is thinly populated, with half its people scattered in small remote villages. There are about 100,000 white persons and 50,000 natives, the latter representing four basic groups: Arctic Eskimos, Aleuts, Southeastern Indians in Totem Pole land and the Athabascans of the inland river country.

Native standards of living have declined tremendously, Dr. Leer reports, presumably because of disruption of culture, introduction of strange diseases and loss of prestige by comparison with the artificial wealth of white people. Incidence of tuberculosis is high with a death rate about ten times that of the white population. An associated incidence of phlyctenulosis and visual impairment from corneal scarring is also seen.

The health problems of these people are now the responsibility of the United States Public Health Service through a group of regional hospitals built and operated originally by the Bureau of Indian Affairs. Usually there is one public health doctor on general duty at each of these field hospitals. The service is attempting to place more emphasis on preventive medicine, but so far, with inadequate help and heavy patient loads, it has been able to offer only general hospital services.

Dr. Leer describes a trip made under the most adverse flying conditions to Barrow, Wainwright, Kotzebue, Nome, and many other areas, including small villages, during which he treated over 1,500 patients and performed some 30 eye operations. He found that the Eskimo has much the same incidence of general eye disease as among the average white people. Incidence of refractive errors, particularly myopia, was quite high.

In the delta of the Kuskokwim River living conditions were at their worst. In children five to eight years of age the incidence of positive tuberculin reactors is known to be an incredible 89 per cent, the highest reported anywhere in the world. Dr. Leer found many children with such severe bilateral corneal scarring as to be almost blind.

"It seems a tragedy," Dr. Leer concludes, "that in a country so wide, so clean, so full of opportunity for natural living, its native people should be so riddled with disease, and so handicapped economically in the face of a declining era of their culture. . . . We introduced them to diseases previously unknown to them and against which they had no resistance. Once decimated, they were then vigorously assailed with the white man's religion, which taught them that the old religions . . . were wrong. The economic base which stressed natural living and foods was replaced by a system requiring money and material things such as radios, outboard motors and white man's clothing. Add to this the physical handicaps imposed by a crippling disease and the problem becomes even more complex.

"The ophthalmologist can readily realize that his work is cut out for him,

with the many problems of visual rehabilitation. We also need to do more studies on the etiology and histopathology of this eye disease, with particular attention to its relationship to the hypersensitivity reaction to tuberculin. . . . New laboratory techniques enabling the study of tagged antibodies for demonstrating fixed tissue antigens could conceivably demonstrate more clearly the nature of the phlyctenulosis process. New methods of tissue culture will enable us to prove conclusively whether the phlyctenule is sterile as it is thought to be.

"There is a life's work to be done—and it is an interesting life."

ADVERTISING STANDARDS

"Do's and Don'ts in Advertising Copy," a loose-leaf publication of the National Better Business Bureau, Inc., devoted a section of its July 1956 issue to eye treatment. To protect the public in general, and particularly those persons who have eye diseases and need professional care, certain advertising standards have been established, including the following:

- Since eyeglasses cannot be safely or accurately fitted by mail, such offers should not be advertised to the public.
- Mail order courses of eye exercises may not be truthfully advertised to correct defects of vision.
- No known medicinal preparation may be truthfully advertised as a cure, remedy or treatment for pathological conditions of the eye or to correct errors of refraction.

Glasses sold by mail have generally been found to be mere magnifying glasses containing exactly similar convex lenses for each eye. In other words, they were good for farsightedness only and then only in such instances as the amount of farsightedness in each eye happened to be of the same character and degree as the lenses were designed to correct. *The chances against securing a proper fit under such circumstances are overwhelming.*

Some advertisers have furnished prospective purchasers with devices with which they are told they can test their eyes and send the results to the company which will then furnish glasses prepared on the basis of the test data. *However, no mechanical device has ever been perfected which will enable the unskilled correctly to fit themselves to glasses.* No one but a trained practitioner can measure the amount of error accurately and prescribe a properly fitting corrective lens and he cannot do it except after personal observation and examination.

Glasses fitted by mail are a hazard to the user because improperly fitted glasses are worse than no glasses at all . . . their use may temporarily conceal a diseased eye condition until such time as it has caused irreparable damage.

Emphasis is placed on the fact that the human eye is a complex and delicate organ, readily injured, and that its ills cannot be safely or scientifically diagnosed or treated through the mails. The use of medicinal preparations such as liquids and salves, often advertised for the treatment of various defects of vision and eye diseases, is obviously foolhardy.

Eye drops and lotions should not be represented as capable of strengthening the eyes or relieving conditions for which professional attention and properly fitted glasses are needed.

REPLICABILITY OF A SCREENING TEST

AVEDIS DONABEDIAN, M.D. and LEONARD S. ROSENFELD, M.D.*

Report on a recent study among first grade children to determine reliability of the visual acuity test currently used in Massachusetts.

A STUDY of uncorrected visual defects among first-grade school children was one of several explorations undertaken with the object of developing simple, yet reliable indices of unmet need for medical care.[1] Because of the importance of reliability in any measurement to be used for this purpose, this study was designed to determine the reliability, under usual field conditions, of the standardized test of visual acuity administered in public schools in Massachusetts. Although in studies conducted in St. Louis[2] it was shown that vision tests are more reliable among older children, first-grade children were chosen for study because it was felt that uncorrected defects among this group which had not yet come under the influence of school health services would provide a more accurate picture of the distribution of unmet need for medical care in the community at large.

METHOD

Study Area and Sample

For purposes of economy and convenience the study did not include the entire City of Boston, but was confined to a segment comprising 65 contiguous census tracts with a population of almost 377,000. It is believed that almost all first-grade students living in this area and attending public schools were included in the study. In Boston about 50 per cent of students attend parochial schools and, therefore, are not represented in the sample.

Test of Visual Acuity

All students in Boston public schools receive a yearly vision test. The method used is the Standard Massachusetts Vision Test developed by the Division of Maternal and Child Welfare of the Massachusetts Department of Public Health.[3,4] This test has been widely used and appears to compare favorably with other methods available for mass screening. In a carefully controlled study by Crane et al.[2] it was demonstrated that the Massachusetts Vision Test and the Snellen test (which was the first part of the Massachusetts Vision Test) were the "most efficient," or "least inefficient," of several methods tested. While the Massachusetts Vision Test provides for testing both near and far vision, this report deals only with the results of tests of visual acuity, as the number of cases of hypermetropia found was too small to be significant.

In its original form the Massachusetts Vision Test was designed as a screening instrument which distin-

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guishes between students who fail and those who pass, without attempting to score severity of defect. In Boston public schools, in the event of a child's failing the test for visual acuity, the examiner is also required to test both eyes and score the severity of the failure in the usual manner. First-grade students with a score of 20/40 or better are passed. For purposes of this study a score of 20/50 was arbitrarily chosen to mean a moderately severe error of vision, and any score poorer than that a severe error. No attempt was made to distinguish defect or error of either eye in the same individual at any stage in the analysis. Each individual student received one score, which was that of the more seriously defective of his two eyes.

The Testers

Vision tests in Boston public schools are performed by a team of full-time workers who are recruited from the nursing and teaching professions. Testers are trained by the Division of Maternal and Child Health. Subsequently, they are given general supervision by personnel of this division. There is a fair amount of turnover among testers since, because questions of tenure are involved, teachers may not serve as vision testers for longer than three years in succession.

The Study Design

In brief, the experiment required that within a few days following initial examinations by regular testers, one "criterion tester," selected by the School Committee of the City of Boston on the basis of experience and apparent competence, examine all first-grade students in the schools that serve the study area. First testers were assigned to districts in accordance with the usual practice of the Boston School Committee. The criterion tester was also scheduled to perform first tests on a group of students in order to permit comparison of her observations on two separate examinations.

The criterion tester was not advised of the results of the preceding test. She was merely told that she was to reexamine all first-grade students for the purposes of a special survey. No other information about the study was given out to any of the testers.

FINDINGS

Except where specified, the following analysis is based on results obtained on all first-grade students residing in the study area who completed tests administered by two examiners. Students who had glasses were included only if they wore them on both occasions. The extent to which results of vision testing, by the methods used, were replicable was examined in several ways as detailed below.

A total of 3,373 students residing in the study area were examined by two testers. The first testers, as a group, failed 214 students, and the criterion tester failed 207. Both testers agreed closely on a failure rate of approximately six per cent. There was agreement with regard to the status of vision (pass or fail) of 2,312 students (95 per cent of the total). There was disagreement of results of the two tests of 161 students representing five per cent of the total, who were passed by one tester and failed by the other.

The results of the two tests are shown in Table I. In this table students who failed were divided into two groups, those with vision of 20/50, and those with vision of less than this

TABLE I

Scores Obtained by Two Testers Examining Same Group of Students

First Tester	Total	Criterion Tester		
		Passed	Failed	
		20/40 or Better	20/50	Less than 20/50
Total.....	3,373	3,166	96	111
Passed 20/40 or better....	3,159	3,082	49	28
Failed				
20/50.....	79	51	19	9
Less than 20/50....	135	33	28	74

level. There are more students with less than 20/50 vision than with visual acuity of 20/50, because the latter represents only a narrow band of visual acuity, while the former covers a wide range. Although the over-all agreement between the first tester and the criterion tester seems large, because of the great preponderance of students who passed both tests, the extent of agreement as to which students failed the test was not large. Of the 291 students who were failed by one or both testers, only 130 students were failed by both testers, a rate of agreement of 45 per cent. Crane et al. have used the point correlation coefficient to state the degree of correspondence in results obtained on two tests, because it is relatively independent of the proportion of total failures reported. Such a coefficient, computed from the findings of this study, has a value of .60 (perfect correlation equals 1.0).

As may be expected, individual first testers varied widely in the extent to which their results were comparable with those of the criterion tester from a low of approximately 35 per cent agreement in one case, to a high of approximately 58 per cent in another.

The criterion tester, by virtue of being a regular member of the vision testing team, performed 160 first tests for students in the study area, and is to that extent included in the group of first testers. In order to examine the replicability of her own results, arrangements were made for the criterion tester to examine twice another group of first-grade students from outside the study area. Results for a total of 556 students who were examined twice by the criterion tester are shown in Table II. As with Table I, the group of students who failed are divided into two groups according to severity of the defect.

Failure rates in the two examinations approximated each other closely, being 7.0 per cent and 6.3 per cent respectively. There was agreement on passing or failing in 98 per cent of the cases. The point correlation coefficient is .86 (perfect correlation equals 1.0). Of the 42 students who failed at least once 32 (76 per cent) failed both tests. It is obvious that the test is significantly more reliable when it is administered repeatedly by a single examiner, than when administered by different examiners. ($P = < .001$) Although this higher degree of reliability

TABLE II

Scores Obtained by One Tester on Two Examinations of the Same Group of Students

First Tester	Total	Second Test		
		Passed	Failed	
		20/40 or Better	20/50	Less than 20/50
Total	556	521	18	17
Passed 20/40 or better	517	514	2	1
Failed				
20/50	19	6	12	1
Less than 20/50	20	1	4	15

may be attributable in part to the fact that the criterion tester was more experienced and efficient than the other testers, it appears possible that individual bias is a factor in determining the outcome of the tests.

Comparison of Degree of Defect

In addition to comparing results of the two sets of tests in terms of passing and failing, data have been analyzed to determine the amount of agreement concerning severity of defects found. A comparison of the findings of the criterion tester with those of other testers shows agreement on severity of defect in 93 cases out of 291 students failed by one or both testers (32 per cent). Among children whose vision was scored less than 20/50 by at least one observer there was 43 per cent agreement. On the other hand, for children whose acuity was graded 20/50 by at least one tester there was agreement in only 12 per cent of the cases. The higher degree of agreement concerning severe defects (less than 20/50) may be partly due to the fact that this designation covers a much wider range of visual acuity than does the moderate defect category.

Similar analyses of degree of agreement concerning severity of defect based on results of two tests conducted by the criterion tester show a higher degree of replicability. Among those children who received a score of less than 20/50 on at least one test, the results of the two tests agreed in 69 per cent of the cases, as compared to 48 per cent agreement when children were classified at least once as having a visual acuity of 20/50.

Furthermore, of the 22 children whose visual acuity was rated at less than 20/50 on one test, only two (9 per cent) passed the other test, when examined both times by the criterion tester. This occurred in 61 cases out of 172 tests conducted by the criterion tester and other testers (35 per cent). These findings are further evidence of the fact that the test is more reliable when administered repeatedly by a single observer than when administered by independent observers.

INTERPRETATION AND DISCUSSION

The study was designed to test reliability of the Massachusetts Vision Test among first-grade children by examining the extent to which results obtained by one tester could be reproduced by another, and the con-

sistency of results obtained by one person in two consecutive trials. Such tests of reliability assume that the majority of visual defects encountered in the age group under study are relatively stable, and do not vary appreciably in severity within short periods of time. For short intervals, this is probably a reasonable assumption to make, though studies on children and adolescents have shown that appreciable changes in vision do occur during comparatively longer intervals of two to three years (Sloane and Gallagher,[5] and Ciocco[6]). Ciocco has noted that, in general, young children are less stable in this respect than older children.

The study design was not calculated to give information about the validity of the test employed. There is no direct evidence that the criterion tester is more or less competent than other members of the team. There is only evidence that the criterion tester can reproduce her own results with a fair degree of consistency. Further study would be required to prove that the criterion tester was not merely repeating results based on consistently erroneous technique, and to evaluate the possibility that the criterion tester or subject retained some recollection of previous responses.

The low level of replicability in the results of the test has occasioned some speculation as to possible causes of variability. Although a great deal of effort has gone into standardizing the Massachusetts Vision Test in terms of equipment, illumination, procedure, and cut-off points, there may be variation in the extent to which prescribed procedure is followed. Perhaps a still greater source of variability is in establishing the necessary relationships between the tester and the very young child, so as to ensure the requisite degree of understanding, cooperation, and concentration of attention on the part of the subject. Testers may vary in their ability to establish rapport.

Using a modification of the Massachusetts Vision Test and stricter standards, Leverett[7] demonstrated that younger children, when retested, change performance from fail to pass more frequently than older children do. Other studies (Yasuna and Green[8] and Benton[9]) have shown that a subsequent ophthalmological examination is more likely to substantiate a confirmed Massachusetts Vision Test failure in the older child, than in those in the first two or three grades of school. Newmayer (discussing a paper by Sloane[3]) has stated that "a child may readily overcome three or four diopters of hyperopia, or two diopters of myopia, and often astigmatism, by use of its accommodation." Whatever may be the reasons which cause variation in results, it seems evident that a single test of visual acuity does not give results that are sufficiently reliable for effective screening among young children.

It is apparent from the preceding discussion that there is need for further research in methods for vision screening, and the distribution and stability of visual defects among school children. The validity of methods for screening visual errors among school children might be further tested by comparing their results with results of careful refraction carried out by an ophthalmologist.

Several such studies, comparing results of the Massachusetts Vision Test with findings of ophthalmologists, have been conducted. (Crane,[2] Sloane,[3]

Yasuna and Green,[8] Benton,[9] Sloane and Gallagher,[11] and Shaffer.[12]) In general, such studies have revealed that a very large proportion of students who have failed the Massachusetts Vision Test on two successive occasions have been found by the ophthalmologist to have required referral. Studies in which all students, including those who passed the screening test, were re-examined are unusual.

A study of the extent to which two ophthalmologists examining the same children, and using the same methods and standards, agree on findings might be of value. Although one study of this sort has been conducted,[13] further exploration of this problem seems warranted. In this way an estimate would be obtained of the reliability of the ophthalmological examination which is usually used as the standard for testing the validity of the screening test. In such studies as those suggested, the possible effects of age and other factors on reliability and validity might be further elucidated.

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REPRINT—The article "Preschool Vision Screening" by Florence Cunningham, R.N., that appeared in the Summer Issue of the *Review* is available in reprint form from NSPB. Pub. No. 187. Price 5 cents.

CLASSROOM METHODS AND MATERIALS
for the Partially Seeing

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An effective combination of state and local effort will help to achieve for every child with a visual handicap full opportunity for growth toward a happy and socially useful life.*

IN applying methods and materials in our work with children who are partially seeing we should be fully aware of certain implications. These children are like all other children in many more ways than they are different from them. They have special interests, desires and innate drives. They are curious, active, possess the will to be independent, desire to be self-directing, and want to try out things or experiment.

Implicit in our approach to teaching is the knowledge that these are primarily "seeing" children. The process of seeing may be adversely affected; nevertheless, they are using vision as their chief channel of learning. The fact that many of them fall in the legal classification of blindness does not alter the basic premise that they are essentially seeing children. This must be recognized not only by those of us directly involved in this area of special education, but by all others coming in daily contact with these pupils. Unless all school personnel accept the partially seeing child as a seeing child he will be categorized as being different to a degree which can seldom be justified in terms of his vision handicap. This attitude can only create confusion in the minds of school personnel as to how best to meet the child's total needs in the school's program. As teachers of the partially seeing, it is in this area of service that we can make our greatest contribution, if our efforts to integrate the child as a step toward helping him achieve satisfactory adjustment to post-school situations are to succeed.

My own experience in New York State and in conferences with individuals representing other states indicates that our partially seeing children are spending increasing amounts of time in school as members of regular classes. Thus, special materials and more effective teaching techniques must be developed for use in helping them function adequately in the setting of the regular classroom.

One of our functions is to put forth considerable effort in helping other teachers minimize the child's vision handicap by placing emphasis on likenesses without ignoring or minimizing the differences that do exist, and which

* Digest of a paper presented at the Workshop on Materials for Instruction, International Council for Exceptional Children, Pittsburgh, Pa., April 27, 1957.

may stem from a particular eye condition. And because of the likenesses it is frequently unnecessary to make special provision insofar as methods of teaching are concerned. All that may be needed are some special equipment and materials to be used by the child. But in numerous instances an understanding of the eye condition leading to better interpretation of the effect it has on the child's ability to function, as well as an understanding of perception and its relationship to sight and learning, will better enable the teacher to improvise readily without impairing the quality of her service to the class as a whole. If we acquire as complete an understanding as possible of these children we are better able to satisfy individual needs and as special teachers assist other members of the school staff to contribute most effectively to their educational growth.

Optical Aids

The work being done today in the field of optical aids opens up a new avenue of assistance to these children. We know that not every one having residual vision can be helped with optical devices. However, near vision, distance and bifocal optical devices as well as microscopic and telescopic lenses are being used effectively. It must be emphasized that the process of prescribing and fitting these lenses requires considerable effort and patience by all involved—the child, the ophthalmologist and the optometrist. Parents and teacher, too, must understand the training needed for effective use of optical aids so that they can help make situations in which the child is functioning as comfortable as possible and thus contribute to his acceptance of these special lenses.

For certain children the use of such lenses will determine the type of educational setting in which they are placed. For others it may determine whether they should be educated as seeing or blind children. We should not overlook the advantages resulting from use of these special lenses and we should encourage school health service personnel to consider this possibility when dealing with the child's parents concerning recommended eye examinations.

Magnification Devices

A number of devices which magnify ordinary print are being used by the schools. One is the AO Projection Magnifier produced by the American Optical Company. There are others which vary in size and practicability. It is desirable to have such a device available for a partially seeing child in the classroom and during after-school hours. However, if he is to derive satisfaction from reading he should not be encumbered with such devices unless they are essential and contribute to his ease and reading facility.

Materials through Federal Act

We should not overlook the possibilities provided under the recently amended Federal Act "to promote the education of the blind." Under its provisions Federal aid will now be made available to state agencies to help provide special textbooks and other materials and equipment for blind children attending public schools. Responsibility for manufacturing and distributing this material is assigned to the American Printing House for the Blind, Louisville, Kentucky—the official schoolbook printery for the blind in the United States. Many par-

tially seeing children who fall in the blind category are eligible for materials under this Act. Although much of the material presently available is intended primarily for children without sight, a number of the items are appropriate for use by the partially seeing.

This Federal program presents an opportunity for us to make known some of the problems and obstacles facing us in the way of providing suitable materials for partially seeing children, so that there will be some motivation for research effort directed toward these needs. The Printing House maintains a research unit and I presume we can expect it to assume a part of this responsibility.

Available under the Federal program are such items as relief globes, plaques, dissected maps of continents, large-type texts and writing paper. The Printing House has also reproduced in large type one of the Stanford Achievement Tests (Form J).

Teachers who have registered with their state departments children who classify as blind may obtain complete information concerning materials available and the manner in which they may be requisitioned from the unit with which the children have been registered. Under this new program New York State expects to register in excess of 660 children with the Printing House.

REAL Program

Among the items available under the provisions of the Federal Act for use by children who classify as blind, and which provide an excellent source of audio aids for use with our partially seeing children, are the tape recordings which comprise the Printing House's REAL program—Recorded Educational Aids to Learning. These enrich and supplement classroom instruction. They cover a wide range of subject matter, are presented in dramatized, radio-program style. Their cost is relatively low—both for the original as well as for the "dubbing" of new material on the tape should a school system desire to have this done. Lists of recordings available under this program are available from the American Printing House.

Use of Tape Recorder

With the advent of the REAL program, it is expected that more of the schools having programs for partially seeing children will include a tape recorder as part of their equipment. In addition to use as a playback device it can also be used for recording supplementary materials, thus increasing considerably its value as an audio aid. The SoundScriber and similar devices are also employed in this way. Volunteers may be needed to transcribe material on tape or records. In some situations the recording can be done by students in speech classes, thus providing an incentive toward achieving better oral expression.

Supplementary Instructional Assistance

With many children handicapped by poor vision there is always the possibility that because they are not able to derive maximum benefit from sensory perception they often derive less than optimum benefit from numerous learning situations, especially if they are members of regular classes full time. To help offset whatever educational retardation may result, there is need for supplementary instructional assistance, especially during the

developmental years in the elementary school. Recognition of this need is reflected in legislation passed last year in New York State which makes it possible for a school district to employ an approved special teacher (itinerant) to serve a visually handicapped child attending a regular class and be reimbursed for her salary.

Whether state aid is available or not, there is need for additional assistance for children having seriously defective vision. Either the regular class teacher must provide it—and frequently if she has the skill to do so she does not have the time—or it must come through some other source. Reader's assistance is not sufficient in many such instances. These children need additional individual attention to help compensate for what they may miss in many learning situations. This concept is frequently ignored because of the cost factor involved. Yet it is an essential service and one which needs to be highlighted with school administrators throughout the country. There is a responsibility for those of us at the state level to orient school administrators to this need.

The Mentally Retarded

A unique problem is presented by children with multiple handicaps, especially those having a combination of mental retardation and a severe vision defect. I have been confronted by resistance on the part of teachers of educable mentally retarded children (50–75 IQ) to serving visually handicapped children in their classes. Several have reported that the combination of mental retardation with a severe vision defect prevents the child from functioning adequately in the activities provided for mentally retarded children who are not handicapped by poor vision. This combination of handicaps may constitute a more complex entity than we have heretofore acknowledged, one that requires careful study and review.

The teacher of the partially seeing has a responsible role to fill in working cooperatively with the teacher of mentally retarded children and resolving the problems centering around both methods of teaching. Understanding of the handicapping condition and the effect it has on a child's ability to function helps reduce feelings of insecurity teachers may have when confronted with such children. This can be achieved through appropriate orientation and in-service training provided by the special teacher.

Reading Activities

In regard to reading activities there may be need for us to alert other school personnel to the special problem confronting partially seeing children. Heretofore, concern has always been expressed about maintaining the usual focal reading distance of 14 to 16 inches. Today there is greater concern for making the most of whatever remaining vision a child has. One can no longer justify insistence on maintaining the usual focal distance if at a shorter distance he can use his vision more efficiently. Many myopic children, for example, can read ordinary print if it is held close to the eyes. This may involve a posture problem, particularly as some of the new-type lenses providing a high degree of magnification require that the material be brought close to the eyes. Perhaps the answer here lies in the development of a desk whose top can be adjusted to varying reading distances.

A child's eye condition may enable him to see only part of a word and thus his rate of reading may be slow. Such cases call for patience and understanding on the part of the teacher since this is a limitation over which the child may have little control. In such instances, or where a child is subject to fatigue associated with prolonged reading tasks, the employment of readers or use of audio aids may be indicated. Here again, the role of the special teacher in her consultative relationships with other school personnel assumes major proportions.

Experimentation supplemented by observation may reveal that for some children 24-point type is not essential; in fact, smaller type may be read more easily. Others may read 18- and 12-point more comfortably and rapidly, since their eye span may enable them to include more words at a glance. As the child learns to use optical aids with increased proficiency the size of print may be decreased.

In several schools in our state the librarian sets up a corner where selected books suitable for partially seeing children are readily available. The library division of the New York State Education Department compiles such materials and lends them. Under the Illinois plan the school librarian helps locate supplementary texts in type of 12-point or larger and sets up a card file listing books according to the approximate grade level.

Typewriting Instruction

We must be concerned about quality instruction in typewriting since poor typing habits are likely to carry over into the secondary school and into college. The teacher of the partially seeing should utilize existing typewriting outlines designed for use with young children and also consult with the trained teacher of typewriting in her school system concerning methods. The child must have the physical capacity to study typing so that this skill may be properly learned. The aim of this instruction is to enable him to prepare much of his written work on the typewriter neatly and accurately. Speed is not essential during the elementary grades and it will develop naturally. There should be a planned daily program of instruction, if possible, with short supervised periods.

We recognize the satisfaction a child derives from being able to read what he has typed. This is possible in many instances because a large-type machine is used. There is no question concerning the value of such machines for our young children. Nevertheless, in view of the progress being made in the field of optical aids consideration should be given to use of typewriters with ordinary type by those children able to profit from such aids. The use of a typewriter with ordinary type enables a child to make better use of typing skill insofar as quantity and arrangement of material on a page is concerned. This is especially important at the secondary school level. The personal value of typing skill to any pupil should not be underestimated.

Creative Art

Free creative art in large form provides an excellent opportunity for self-expression. The use of charcoal, pastels, poster paint, etc. is recommended. Stress large bold strokes when using crayon, chalk and paint. Finger painting and work with clay are particularly suited to the needs of children having limited vision. No fine, intricate work

should be undertaken nor should copy work and drawing with an ordinary pencil be permitted, unless indicated by the eye examiner.

Music Appreciation

Music provides both satisfaction and release from tension for the visually handicapped child. It may be necessary to enlarge musical notes to a point where he can read them. From the large selection of musical recordings a child can learn a variety of songs and sing them in company with the other children during the music period. The recordings also provide an opportunity for music appreciation.

The opportunity to study instrumental music should not be denied these children. The approach to learning may require a great deal of memorizing, but such study has led to a high degree of skill in many.

Physical Education

Some eye conditions may necessitate physical restrictions. The school health service and the child's eye physician should be consulted prior to his participation in physical education activities. In no instance should restrictions be placed upon a child simply because of a vision defect. Only a few eye conditions necessitate certain limitations.

Whenever group games are played the child with limited vision should be assigned a part which he can successfully carry out. If at all possible, no situation should be allowed to arise where he is compelled to be a bystander. The child must have opportunity to participate in some capacity in most class activities if he is to acquire feelings of acceptance and status among the group.

The program of social studies or citizenship education involves the use of practically everything that has been touched upon here. Thus the challenge to the special teacher is a tremendous one. She must use her ingenuity in finding techniques to impart to the child that which will enable him to make appropriate improvisations leading to satisfactory compensation for his visual limitation.

Learning to Listen

The child with limited vision depends upon his auditory sense in many learning situations. Learning to listen is a must for many of these children. In such instances it is incumbent upon the teacher to make certain that pertinent points in a lesson are clearly understood. Her remarks will not necessarily be supplemented by reading or resort to a recording on the part of the student. However, there is a danger of excessive verbalization by the teacher. This should not be a substitute for actual contact and participation in situations that provide the child with essential experiences which, in turn, help him acquire meaningful concepts. The teacher should be near enough, if possible, so that she can unobtrusively give him necessary help.

The basic goal must be to do all that we can to assist every child who is partially seeing to achieve his fullest potentialities for wholesome growth and development. Our responsibility to these children is as great as it is to other children. Thus our approach to providing adequately for their needs should be based on a concern that no child should suffer unnecessary maladjustments in the educational setting through our failure to exercise proper efforts to deal with his special problems.

EDUCATION of the PARTIALLY SEEING CHILD

The contribution of alert and intelligent students to this session made it one of the liveliest and most interesting of the NSPB Annual Conference.

Chairman: Anthony J. Pelone, chief, Bureau for Handicapped Children, State Education Department, Albany, New York.

Panel Members

Edward H. Burke, guidance counselor, New York City Board of Education.

Mrs. Ella K. Stein, sight conservation teacher, Abraham Lincoln High School, Brooklyn.

Howard M. Goldsmith, sight conservation teacher, William Cullen Bryant High School, Queens.

Students: (Lincoln) Martin Spindel, Lee Selwyn, Barry Teiman, Stephen Goldberg. (Bryant) Elizabeth Goodwin, Gilda Finazzo, Caroline Colombo, and William Cassidy.

IN recording this conference discussion one wishes that the printed page might more vividly reflect the spontaneous and uninhibited participation of the eight young panel members. Certainly the program gave proof that the methods used by the better schools for the education of the partially seeing are successful beyond question, and that these students are normal, happy young people with bright futures.

Advances in N. Y. State

In his opening remarks Mr. Pelone spoke of the new era of service to physically handicapped children that is beginning in New York State. Article 89 as amended, and other legislation passed this year, makes this possible. School districts may now employ approved special teachers to assist in providing educational services for the physically handicapped in regular classes, or on an itinerant plan. A school district can now be fully reimbursed by the state for the salaries of special teachers. Thus it will be possible to retain many more physically handicapped children in regular class settings in their neighborhood schools than was formerly thought feasible, and to serve them more effectively. Mr. Pelone noted that school administrators may now give thought and study to extending these services. The opportunities implicit in this legislation, he indicated, are tremendous indeed, but such service becomes meaningful only when through it our hands reach out to help a child.

Mr. Pelone said that in three residential schools for the blind in New York State there are 460 children classified as legally blind who are partially seeing. In addition, there are 645 such children not in residential schools. All will be registered with the American Printing House for the Blind to get large-type material. The majority are partially seeing children who meet the legal definition set up by the government to benefit from provisions of the Federal act.

N. Y. City Plan

Mr. Pelone introduced Mr. Burke, who explained that the facilities for the partially seeing in New York City are the responsibility of the Bureau for the Education of the Visually Handicapped. This is staffed by a director, two supervisors, a social worker, a guidance counselor and 90 teachers. Seventy of the latter are on elementary school level, 12 junior high, and eight senior high. Over 1,000 pupils are registered in sight conservation classes on all three levels, in schools scattered throughout the city's five boroughs. Some of the students travel considerable distances to the high schools.

Mr. Burke introduced in turn Mrs. Stein and Mr. Goldsmith who outlined the programs under their supervision. Mrs. Stein said that the sight conservation class in Abraham Lincoln High School was started five years ago. In order to induce graduates of elementary school classes to join it she made numerous home visits and telephone calls. The class opened with five pupils, and now has a register of 24. Plans are being formulated to organize another class in a nearby high school.

Each spring Lincoln School holds an open house to which graduates of elementary and junior high school sight conservation classes, as well as parents and teachers, are invited. Prospective freshmen are taken on a tour of the large building; a guidance counselor tells them about the various courses offered and shows them the special equipment. Most important of all, Mrs. Stein emphasized, is the chance given to the visitors to talk informally with the sight conservation students already enrolled. Many a doubting Thomas, she said, has left after this visit anxious to return in September.

At Lincoln the sight conservation students are all assigned to Mrs. Stein's home room. She meets them all each morning for a 15-minute period, during which they discuss their problems, and arrange for special events of the day. Every Lincoln student must report to a home room each morning for this 15-minute period; thus the sight conservation students follow the general plan of the school.

Teacher's Role

The high school teacher of sight conservation, said Mrs. Stein, renders service to her students in many ways. She cooperates with the program committee and the grade advisers in setting up individual schedules to suit each pupil's physical and intellectual needs. She does remedial work where required, re-teaches phases of a subject where chalkboard work is involved in the regular class, arranges for student readers and typists, and offers a day-to-day counseling service as problems arise. Her students know that she is always ready to listen to their complaints or their enthusiasms; and the sight conservation room is a place for relaxation from the strains of study as well as a place to work.

Mr. Goldsmith pointed out some important considerations in making a program for each of the Bryant High School sight conservation pupils. The basis is eight 40-minute periods, plus a 20-minute home room period. Subjects are spaced to avoid having close eye work periods follow each other; cooperative teachers are chosen to insure sympathetic understanding of the pupils' problems and the freedom of the classroom which others enjoy. At

all times during the day the sight conservation room and teacher are available for help as need arises. Arrangements can be made for student readers and tutors in the subject classes. Frequently students prepare material in large type. Mr. Goldsmith emphasized the need for careful attention to all details of program organization at the beginning of the term.

Reports from Students

Highlighting this conference session were the reports of the student panel members and the question period in which they all participated. The following summaries, prepared by the students themselves and unedited, relate to their courses of study and the careers they are planning:

STEPHEN GOLDBERG: I am a senior in Abraham Lincoln High School. When people first hear of the sight conservation class the first thought that occurs to most of them is that it is a special class completely separated from the rest of the student body. This is, in reality, a complete fallacy as my full four-year course of study proves. I have been active in many school activities both as elective subjects and extracurricular activities. For example, I am a member of the school band, the orchestra, the Senior Council, and the Music Honor Society. I have also been in the Tennis and Rifle Clubs.

You might get the impression that all we do is just participate in the lighter and more enjoyable aspects of high school life. In my own particular case, I have all the credit I need for an academic diploma in June. I obtained all my credits in regular classes like every high school student does. Of course I had the use of our special equipment, our enlarged textbooks, the Talking Books, and the guidance of the sight conservation teacher. When the time came for the college entrance examinations I was supplied with a large-print test administered by my sight conservation teacher through cooperation of the College Entrance Examination Board in Princeton, New Jersey, the world-wide testing agency.

I have found that the sight conservation class has helped me achieve a successful and enjoyable high school career.

ELIZABETH GOODWIN: I am in the first year at William Cullen Bryant High School. In my sight conservation class I have various equipment and supplies which are available for me to use. I would like to familiarize you with some of these things. My favorite piece of equipment is the Projection Magnifier which we received last term. I find this machine makes newspaper reading easy. I can read in five minutes if I use this magnifier material which would take 20 minutes without it. It is also good for seeing textbook diagrams and names on small maps or charts.

The large-type typewriters help print material that is easier for me to read. Student typists type for me but next term I intend to take typewriting. The Talking Book Machine is fine but usually the records are too long for me to take the time to listen to in school. I have a Talking Book Machine at home.

We have a radio and a tape recorder. We have special desks in our sight conservation room. These desks can be adjusted for reading or writing. There is a library of large-type books in the sight conservation room which I have found useful. I usually use special sight conservation pencils which are

Discussing New York City's program for partially seeing students, left to right: Mrs. Ella K. Stein, teacher, and students Martin Spindel, Lee Selwyn, Barry Teiman and Stephen Goldberg, all of Lincoln High School; Edward H. Burke, guidance counselor; Elizabeth Goodwin, Gilda Finazzo, Caroline Colombo, William Cassidy, students; and Howard M. Goldsmith, teacher, all of William Cullen Bryant High School.

available free. For algebra we have a supply of specially enlarged graph paper. There are large maps on the walls of the sight conservation class. They are handy for social studies work. I really feel that a class with all this equipment is useful to me. It helps me receive better grades in my subjects.

BARRY TEIMAN: I am a sophomore at Abraham Lincoln High School. The students of the sight conservation class are by no means coddled. They go to regular classes and do all the work. I am in a special experimental Spanish class called Spanish through Pictures. In this class we see slides and motion pictures especially prepared for this course. We also have a Spanish through Pictures book that follows the film. If I miss a slide or a portion of the film in class, I can go to the sight conservation room and there take out the record player and listen to the sound track that we have recorded on records. For the first year of this course all work was oral and the only eye work was looking at the pictures which are stick figures without too much detail. Our records of the sound track were helpful for reviews.

We don't expect high marks from our subject teachers without working for them. We want to be treated just like any other high school student.

GILDA FINAZZO: I am in the second year at William Cullent Bryant High School in Queens. I would like to tell you what my program is during this present term period by period. First period I take home economics one. The second period I have a study period in the sight conservation class. There are student readers and typists available as helpers. The third period I take merchandising two which is a course on the study of textiles. This subject covers many different materials such as cotton, linen, nylon, dacron and woolens. In this class I have a student reader assigned to me. She copies notes for me from the board and reads from the textbook. She also reads tests to me.

The fourth period I have biology two. I also have a student assistant assigned to me in this class. She does the same as my merchandise reader.

The fifth period I have lunch. The sixth period I have English four. During this period I go to the sight conservation class for assistance if the teacher gives reading of small print. The seventh period I have a study period in the sight conservation room. The eighth period I have typing three. I have a student reader who reads the drill material to me as quickly as I can type it. In this way I can develop speed. Next term I plan to continue with English, typing, home economics and merchandising. In place of biology I expect to start world history.

LEE SELWYN: I am a junior at Abraham Lincoln High School. I have been in Lincoln for less than a year. I previously attended a residential school for the blind. After spending over two and a half years there I began to miss certain things. I wanted to go home daily to have friends my own age in my neighborhood. I felt that a big New York City high school would offer certain courses such as trigonometry, advanced algebra and solid geometry which I wanted to take to prepare for my career as a mathematician. I wanted to be in classes with normally-sighted students because I knew that this was the situation I would have to encounter when I go to college. I believed that the sight conservation program in high school was the answer to all of my needs and I found this to be true.

CAROLINE COLOMBO: I am in the first year at William Cullen Bryant High School. I would like to acquaint you with some of the situations that I meet when it comes to taking tests. Tests are important because we all know they make up our grades. Sometimes they are a problem besides the problems in the tests. The best is when my subject teacher sends a copy of the test to my sight conservation teacher in advance. It can be enlarged on our large-type typewriters and be ready for me to take at the regular time. I prefer this way. Sometimes the teacher writes the test on the board and I have to go back and forth from my seat to the board in order to see it and I find I lose time and it is difficult for me. Usually, teachers will allow me extra time to make up for some of this difficulty. Other times the subject teacher will give me their copy of this test. If it is written clearly it is not difficult for me. Some teachers write up special copies for me in advance. This is a help.

On some occasions student readers can read a test and this helps cover it quickly. I have been doing this in my French class this term and it works out very well. There have been times when I have managed mimeographed material. This has been difficult and we usually try to avoid this.

As you see there are various ways I take tests. Of all, I prefer to have the test typed in advance in large print when this is possible. A student reader is my second choice.

MARTIN SPINDEL: I am a senior at the Abraham Lincoln High School. I would like to tell you about our class. We have 24 students. Seven are seniors, three are juniors; there are seven sophomores and seven freshmen. There are three types of courses offered in our high school leading to three kinds of diplomas. These are the academic diploma for students who want to enroll in a four-year college; the commercial diploma earned after

a commercial course leading to employment after graduation; and the general diploma which certifies graduation from a four-year high school course and which may be offered as the entrance requirement to two-year colleges such as New York City Community College, or Brooklyn College of General Studies. Our present graduating class has three seniors who will get an academic diploma and four who will get a general diploma. We have all been interviewed by a counselor from the State Division of Vocational Rehabilitation and have found this service to be of great help in planning our futures.

Speaking for myself, I am preparing to enter college in the fall and take the liberal arts course majoring in social studies. A few months ago, together with thousands of other New York State high school seniors, I took the state scholarship examination. To help me I was allowed to take the Projection Magnifier into the examination room and I was allowed to use additional time if needed. When I get to college I expect to benefit from the experience of one of our classmates who is now in Clark University, Massachusetts. She has a Sound Scriber and an organization called Recordings for the Blind have sent her all her college textbooks on records. She also used a grant she received from the Lighthouse to buy her own Projection Magnifier. I know that my high school sight conservation experiences have equipped me to cope with the problems I expect to face in college.

WILLIAM CASSIDY: I am a sophomore at William Cullen Bryant High School. I would like to acquaint you with the two important state agencies which my sight conservation teacher can direct us to for vocational guidance.

In our junior or senior year we can go to the Division of Vocational Rehabilitation for counseling and testing. This state agency gives aptitude tests and sometimes arranges special training after graduation so as to prepare us for a job. For sight conservation pupils who are very severely handicapped there is the Vocational Rehabilitation Service of the New York State Department of Social Welfare. They too give counseling and testing services. This agency will finance special training to qualify boys and girls for a job and help get special equipment for college and high school sight conservation pupils. They will sponsor worthy pupils for college by partial financing during their college career.

These two agencies can help pupils start a useful life. It is important that we set up sensible goals which we can reach if trained and directed properly.

Questions and Answers

A period of questions asked and answered by the panel of students followed. These are recorded in part:

Question: What are some useful tips you might give freshmen sight conservation pupils in your school?

Answer: Just because they have a handicap is no reason they are different. Make friends. Everyone is willing to help.

Q: How does the regular high school library help you?

A: Our library has a special corner for us with books in large print. When new books are bought those with best available type are chosen. The library

trusts us with reference books to take into the sight conservation room, so that we may use them with the Projection Magnifier.

A: We don't have a special corner but the librarians are very glad to help us. They type books in large type so that we don't have to take books out of the library. If you ask for help you get it.

Q: Which subject do you feel has been the most difficult because of your eye condition? Why?

A: Algebra and French. Algebra because of the exponents, and French because of the accents.

A: Mathematics, especially trigonometry, because of the details.

A: Health education. There is activity going on in all corners. I can't see out of my left eye and always wonder what is coming from that side.

Q: What help did you get from the sight conservation teacher yesterday?

A: My teacher enlarged a modern history test that I had to take.

A: My teacher read assigned stories not available on the Talking Book.

Q: Do you belong to any school club or team, or do you render any special service on behalf of your school?

A: I am a member of the visual aid squad.

A: I am a member of the senior council.

A: I am a member of the rifle team.

Later there were questions from the floor, including the following:

Q: What vocations will the boys and girls plan to enter?

A: (Students) I hope to be a high school science teacher in social or physical science.

I want to major in mathematics.
I'm interested in electronics.
I'd like to be an art teacher on the high school level.
I'd like to teach younger handicapped children.
I'd like to be a dictaphone operator.
I'd like to go on to college.
I'd like to be a biochemist.

Q: Are there any fields that are definitely barred to people with partial sight?

A: (Mr. Burke) Studies indicate that there are comparatively few; youngsters with all types of visual difficulties engage in various fields of endeavor; it depends upon the nature of the individual's handicap, his initiative, and intelligence. When interviewing a student, the guidance counselor strives to get the student to evaluate himself and to set up future goals in keeping with his intellectual and physical potentialities.

Q: How do you adapt, grade and record standardized tests?

A: (Mrs. Stein) An ordinary standardized test in small type is not usually acceptable. I believe teachers are now beginning to make use of the Projection Magnifier in some cases.

A: (Mrs. Helen Fields, director, Bureau for Education of the Visually Handicapped) Standardized objective tests are given to children in the schools. The visually handicapped are excluded from the general city wide group testing program; only enlarged Stanwix House tests have been used for partially seeing children under guidance of the Bureau of Reference and Research. These tests are no longer available in large print. I have been informed that a new enlarged-

print testing program will be available within a year.

A: (Mr. Goldsmith) In spite of enlargement we allow one-and-one-half times ordinary time allowance.

Q: (Parent) I understand some of the children will be going to the High School of Science and other schools that do not have sight conservation classes. How provide for them?

A: Where no special classroom is available, we provide special services with books and other materials. The Projection Magnifier can be helpful. In the future we plan to have more itinerant teachers to service students who pass an entrance examination required for admission to such schools as the High School of Science.

Q: What special help, if any, do the pupils receive at home?

A: (Lee) I have a Projection Magnifier.

A: (Martin) I have a sight conservation-conscious mother; she is a teacher. When I have to do work at home from small print books she reads to me.

A: (Elizabeth) I have a Talking Book which the Lighthouse has lent me. I also have a large-type typewriter. Mother and Father do not see well; the Talking Book helps me a lot.

Q: What about the slow-learning child on the secondary level? Doesn't he require more work with the individual teacher?

A: Slow learners do require more work; they have to be guided by the sight conservation teacher to budget their time and use it wisely. Very often she has to read to them, to interpret the English language. In the high school we give applied courses for students who cannot manage the regular courses. But the same is true of slow students with normal vision.

Q: Do the children make use of the small high-powered magnifiers?

A: Very little. Occasionally, to see exponents in a math book.

Q: What use do you make of the tape recorder in the high school?

A: (Caroline) Tape recorders help me in my studies.

(Barry) I use the tape recorder in foreign languages, to try out accents.

(Lee) When high school required reading is not available on the Talking Book or in large type, the books are put on tape recorders by the sight conservation teacher.

Q: I understand the Projection Magnifier is available in 3X and 5X magnification. Which is used in the schools?

A: (Mrs. Goldsmith) I have a 5X. Some of my very severely handicapped pupils find this satisfactory.

A: (Mrs. Stein) We use the 3X. We find it better because too much shifting of the book when reading is not involved and there is a larger area of enlargement.

(*Discussion from floor indicated 3X preferable to 5X for above reasons.*)

Q: Do any of the pupils feel the contrast is not strong enough when viewing material with the Projection Magnifier?

A: This depends upon where the Magnifier is set up, especially with regard to reflected glare. We feel, however, the Magnifier should have a deeper hood.

NOTES AND COMMENT

• Decrease in Injuries

A study of the anatomical location of 201,901 disabling nonfatal work injuries to civilian Federal employees covering the five calendar years 1951–1955 has recently been completed by the U. S. Department of Labor's Bureau of Employees' Compensation. The study represents a total exposure of 12.3 million man-years; and rates are expressed in terms of the annual number of such injuries per 100 thousand employees.

Edward F. Brayer, chief statistician, reports that the most significant area of improvement was found to be that of eye injuries. Over the period surveyed the rate has decreased sharply each year, from 107.1 in 1951 to 64.2 in 1955, or a 40 per cent reduction. The crusade to combat occupational tuberculosis was likewise notably successful with a 28 per cent decline in the rate.

During the entire period surveyed there is reflected an overall 7.5 per cent reduction in disabling nonfatal injuries. With a work-force running into the 2.4 millions such a decrease is noteworthy. Significant improvement from here forward will probably depend increasingly upon expanded and intensified preventive programs.

• Toy Firearms Condemned

In an open letter Dr. Joseph J. Fried, New York ophthalmologist, has condemned the inclusion of even minimal amounts of explosives in toy guns. Dr. Fried had occasion to examine a two-year-old girl who a day earlier sat quietly with her mother on a bench while two other children nearby played with a "space gun." The gun had been pointed and fired at the little girl, who screamed and clutched her left eye.

Examination of the eye revealed irritation and signs of contusion, with lacerations of the lids, palpebral conjunctiva, cornea and left nostril. The intraocular structures fortunately were not involved.

Dr. Fried's letter reporting this case states that he believes toy guns of this type to be very dangerous, and that their manufacture should be investigated and banned.

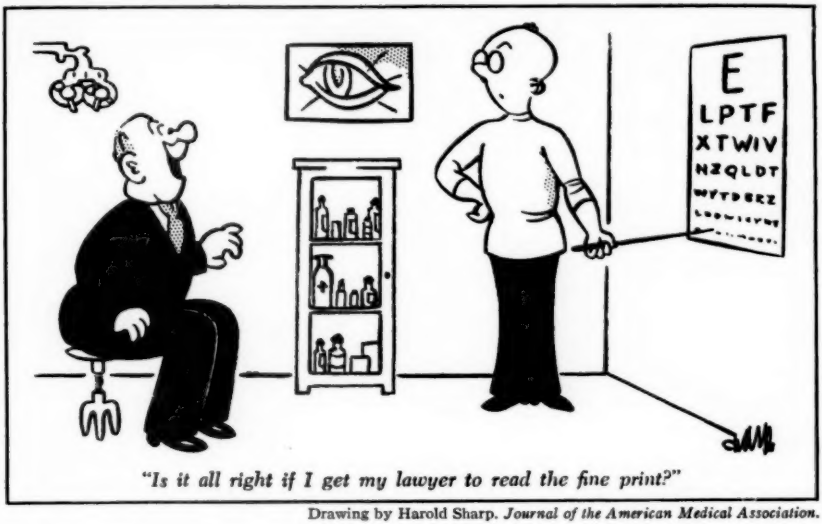
• Low Vision Clinic

The Canadian National Institute for the Blind announces that a Low Vision Clinic has been established at Toronto Western Hospital under the direction of D'Arcy MacDonald, M.D. Service is offered to anyone in that area who requires a low vision aid.

• Dr. Vail is Doyne Lecturer

On July 2 at Keble College, Oxford University, Dr. Derrick T. Vail, chairman of the department of ophthalmology of Northwestern University medical school, delivered the Doyne memorial lecture and received the Doyne medal before members of the Oxford Ophthalmological Congress. Dr. Vail is the second American in the history of the Congress—founded in 1909 by Robert Doyne, famous British ophthalmologist—to be so honored. The subject of his address was the zonule membrane, an important factor in cataract surgery.

In addition to this latest honor Dr. Vail has received the Legion of Merit, the Bronze Star medal, the Order of



"Is it all right if I get my lawyer to read the fine print?"

Drawing by Harold Sharp. *Journal of the American Medical Association.*

the Crown of Belgium, the Medal of Gratitude from France. He was in charge of all eye work in the European Theater of Operations during World War II, is an honorary member of the Ophthalmological Society of the United Kingdom.

• Suits for Sight Loss

A New York mother has brought suit in Queens Supreme Court for one million dollars damages on the grounds that her son, now six years old, was blinded by excessive amounts of oxygen administered when, as a two-and-a-half-months premature infant, he was placed for several weeks in a New York hospital incubator. The child, weighing only three pounds four ounces at birth, was born in the spring of 1951.

According to recent news reports, a beverage company has settled out of court a suit brought for loss of an eye by a young woman in South Orange, N. J. Ten thousand dollars damages were awarded following her testimony that as she carried a cardboard carton of soft drinks two of the bottles exploded, a piece of glass entering her eye.

• Dr. Paton Honored

Dr. R. Townley Paton of New York recently received an imperial honor from the Shah of Iran in recognition of his service to Iranian public health. Companionship in the Royal Order of Homayun was conferred on Dr. Paton in March by Iranian Ambassador Ali Amini in ceremonies in Washington. Dr. Amini termed the decoration "a symbol of the gratitude of my Sovereign for the services you have rendered to my country."

Dr. Paton, who is vice-president and medical director of The Eye Bank for Sight Restoration and a member of the board of directors of the National Society, has long been associated with the Iran Foundation, Inc., which administers Nemazee Hospital and other health and education activities. He has made several trips to that country in the interest of trachoma control and setting up clinics for treatment.

AROUND THE WORLD

AUSTRIA

Injuries in Athletes. Because myopic athletes are particularly susceptible to ocular injuries this condition should be looked for at the time of their medical examination. K. Safar made this recommendation at a recent meeting of the Vienna Medical Society.

As reported in The *Journal* of the American Medical Association for June 1, 1957 Dr. Safar said that about five per cent of detachments of the retina are probably due to athletic exercises. Persons with a tendency to retinal detachment may be allowed to swim, but not to dive. He cites the case of a well-known diver who became blind in one eye because of retinal detachment some time before a rational operation for this ocular disease had been devised. She did not give up diving, despite warnings, and became blind also in the other eye.

BRAZIL

Symposium Planned. The Pan American Association of Ophthalmology has announced from Sao Paulo the decision of its Prevention of Blindness Committee to present in the near future a symposium on the causes of blindness. Dr. Moacyr E. Alvaro, executive director of the Association, reports that this will be planned in cooperation with the Brazilian Health Department. Some of the lectures which will be presented in the principal cities of Brazil will be broadcast by radio and television.

INDONESIA

Incidence of Trachoma. Trachoma is the major cause of blindness in Indonesia and that country, according to Dr. J. Leimena, may have the highest incidence in the world. In the areas of Djakarta-Tangerang, Cheribon-Semarang and Surabaia-Gresik 50 to 75 per cent of the population is affected. On Java the infection rate among school children is 40 to 50 per cent.

Dr. Leimena reports in the *Journal D'Ophtalmologie Sociale* that an urgently needed pilot project, aimed at stamping out the disease, is planned by public health authorities in cooperation with WHO and UNICEF. The experience gained from this will be utilized in a broad anti-trachoma campaign.

The working program for the next few years includes the establishment of eye health centers and clinics, and the training of ophthalmic experts, physicians, nurses and other assistants to control eye diseases and fight trachoma in particular.

PARAGUAY

Prevention of Blindness Center. At the Second Pan American Congress of Ophthalmology in 1945 Dr. D. Crispin Insaurralde, honorary president of the Ophthalmological Society of Paraguay, recommended the organization of blindness prevention programs. He pointed out that about 70 per cent of blindness in South America is preventable through adequate medical care and public health education.

One study showed that of 1,353 people with eye disease, 1,070 lost sight in one and 283 in both eyes. Corneal scars due to infection were responsible in most cases. Other causes of blindness were ocular injuries, glau-

coma, uveitis, papillary lesions, and retinal detachment.

In January 1956, with the help of the Red Cross and the Lions Clubs of Paraguay, Dr. Insaurralde founded the Blindness Prevention Center in Asuncion with a staff of five physicians and a separate glaucoma clinic. An Eyeglass Bank was established to provide glasses for needy people.

Recently the center celebrated its first anniversary and issued an annual report of its activities in the *Boletin Oftalmologico* for January. During the first year the staff performed 3,423 examinations. A total of 127 persons were found to have eye conditions requiring treatment. There were 40 cases of cataract; 30 glaucoma. Also given were 1,618 driver vision tests.

UNION OF SOUTH AFRICA

Attack on Accidents. The Bureau for Prevention of Blindness of the South African National Council for the Blind in Pretoria has launched a campaign against eye accidents in children and industrial workers. Lectures have been given in the schools and plants and various safety articles have appeared in local journals.

Of 57 children visited in the eye ward of Pretoria General Hospital 18 had been injured by bows and arrows, catapults, stones, berries, pencils and other sharp objects. Several of the 43 adults hospitalized for industrial eye injuries had lost the sight of one eye.

Several years ago the Bureau set up mobile ophthalmic units acting as operative theatres and instruction centers. On a series of trips in 1956 through the Rustenberg, Leydsdorp and Pietersburg native areas a total of 3,452 people were examined, 2,406 of whom had eye diseases. Trachoma, with its complications, was the most prevalent; 73 per cent of the examined population suffered from this disease.

GLAUCOMA CONTROL MANDATORY IN CHILE

Since May 1956 the Republic of Chile has included glaucoma among the diseases that are submitted to mandatory research and periodic control under the preventive medicine law. Dr. Santiago Barrenechea, of Santiago, reported at the 1957 Annual Conference of the National Society that as a result over 70 per cent of the adult population of Chile is undergoing ophthalmological examination —visual acuity, tonometry and fundus. All cases showing suspicious signs of glaucoma are sent to the various eye clinics for periodic and mandatory control every three or six months, according to individual requirements.

This law on preventive medicine provides that every glaucoma patient who according to his doctor's orders needs to leave his work temporarily for any length of time, in order that treatment may be more successful, can do so without losing his salary, whether he be a private or government employee.

Dr. Barrenechea expresses the hope that great benefits will soon be obtained under this program. Credit for it is attributed to the Chilean Ophthalmological Society which has fought for the law for many years.

"Medical Social Work with Eye Patients" an article by Laura Jane Henrich, reprinted from *Sight-Saving Review*, is available at 5 cents per copy. Pub. No. 103.

CURRENT ARTICLES

The Early Diagnosis of Glaucoma. Sir S. Duke-Elder. *Transactions of the Ophthalmological Society of the United Kingdom.* Vol. 76, p. 3. 1956.

The mechanism of the rise in ocular tension in simple glaucoma is a physical blockage of the drainage of the aqueous humor in its flow from the anterior chamber to the episcleral veins. The precise site of the blockage is yet unknown. In the early diagnosis an endeavor should be made to determine the onset of three things: vaso-instability; sclerosis in the posterior segment; and sclerosis in the anterior segment.

The development of vaso-instability is best assessed by the demonstration of an abnormal diurnal pressure curve. The development of a permanent high tension is a relatively late symptom of established simple glaucoma. A single measurement of the tension is useless in the early stages; and a diurnal variation of more than 5 mm. Hg, as measured by the Schiøtz tonometer, is suggestive of glaucoma even though the variation constantly lies within what are generally considered the limits of normal tension.

The condition of sclerosis of the posterior segment is assessed by an analysis of its structural and functional effects, that is, by ophthalmoscopic observation of the optic disc and the measurement of the visual field.

Early cupping is difficult to recognize. It begins segmentally, usually as a slight dip which initially does not involve the vessels, typically in the lower temporal quadrant. No one can assess its earliest stages, and no one can follow its course by isolated clinical examinations relying alone on memory. It is quite essential to draw the disc in every suspicious case and compare one drawing with its successor, when the gradual spread of the dipping of the margin and the gradual increase in depth can be assessed. Provided fundus photography is unusually good it will effect the same purpose with greater accuracy. The peripheral field should be plotted on the perimeter with special care for evidence of an early nasal step; while the central area should be explored by the campimeter. For this, the author prefers a two-metre grey screen and a minute spot of light as the target in dim illumination. The three phenomena which should be searched for in the earliest stages are a depression of the upper field, Roenne's nasal step, and, most particularly, small scotomatous areas lying between the 10° and 20° circles in the upper part of the temporal field initially unconnected with the blind spot but so orientated that their extension would form the well-known sickle-shaped Bjerrum scotoma continuous with the blind spot and arching nasalwards around the fixation area to the horizontal meridian on the nasal side.

The detection of a decreased facility of outflow of the aqueous at the angle of the anterior chamber is evaluated by studying the capacity of the drainage channels to cope with the situation when the outflow is put under conditions of stress. Two methods are available: forcing extra aqueous out of the eye under pressure, or increasing the formation and therefore the outflow of this fluid. A simple, rough test using the first technique, and one

which often gives useful information, is to leave the tonometer on the eye for three minutes or so and observe the resulting decrease of pressure. More accurate and detailed information can be obtained by tonography or the bulbar pressure test (Blaxter) which is preferred by the author.

In closed-angle glaucoma (a term which the author prefers to the older one of congestive glaucoma) a consideration of the mechanism of the episodic rises of tension gives the best logical basis for the techniques of early diagnosis. The rises are due to closure of the angle of the anterior chamber by an approximation of the root of the iris to the trabeculae and the periphery of the cornea. This is generally caused by a bellying forward of the iris. In the usual type of eye affected the axial depth of the anterior chamber is shallow, the lens disproportionally large to the relatively small cornea; the lens-iris diaphragm lies well forward and the angle of the anterior chamber is narrow.

Diagnosis of closed-angle glaucoma in a phase of raised tension is easy. In a quiet interval between early episodic attacks diagnosis is much more difficult and a much more important problem. Changes at the disc, in the visual fields, and in the visual acuity are absent; between hypertensive episodes the facility of the outflow of the aqueous is normal. The diagnosis depends on three considerations: assessment of the patient and his ocular history; adequate examination of the eye including the angle of the anterior chamber; and, only if necessary, the artificial production of a rise of tension by a provocative test.

The importance of the diagnosis of closed-angle glaucoma at an early stage is even greater than that of simple glaucoma. Left to itself a disastrous congestive attack may develop at any time with dramatic suddenness, resulting, at best, in permanent impairment of vision, and at worst in considerable visual loss and the eye rendered permanently vulnerable by the presence of synechiea. Taken at an early stage, when the angle is still open, although narrow, miotics may keep the condition under control for long periods, but despite their use hypertensive relapses occur in almost half of the cases. A small peripheral iridectomy, on the other hand, makes this patient safe. At a later stage when peripheral synechiea have formed, the permanent weakness of a drainage operation is necessary. The peripheral iridectomy does not cure the underlying vascular instability that causes the disease, but puts the patient in a safe condition of a person similarly constituted but with a widely open angle. A peripheral iridectomy is a slight operation, it involves no visual disability, and its prognosis is good. If a patient suffers a unilateral acute attack the author recommends such an operation as a prophylactic measure in the fellow eye, provided its angle is narrow.

The Early Diagnosis of Glaucoma. P. L. Blaxter. *Transactions of the Ophthalmological Society of the United Kingdom.* Vol. 76, p. 15. 1956.

Glaucoma should be suspected in two groups of patients: Those who are already known to have the disease in one eye; and those who have a family history of the disease (about ten per cent of all cases). It is advisable to examine the optic discs of every patient whatever the reason for the office visit.

In glaucoma simplex changes at first may be very slight so that it is impossible to detect them with the fingers and the ophthalmologist has to rely on the tonometer. The most efficient instrument for general use is the Schiøtz tonometer; the best type probably is the weightless X model, although the weighted type has its definite uses, especially for measuring scleral rigidity. Inherent inaccuracies due to mechanical imperfection and technique can be overcome to a great extent by experience, but there will always be a possible error of about ±2 mm. Hg. Manufacturers have tended to depart from the original specifications of Schiøtz so that all such instruments cannot be relied upon to give the same absolute values. Jackson has cooperated with the manufacturers in England to produce a standard weighted tonometer with which it is possible to check any other instrument.

Friedenwald found that because of scleral rigidity a tension of 32–37 mm. Hg. can occasionally be found in the normal eye. Therefore, before drawing conclusions from readings showing an apparent pathological increase in pressure, scleral rigidity must be checked. This can be done with a weighted tonometer using the five and ten gm. weights. If the reading with the greater weight is consistently higher than that obtained with the lesser weight the sclera is abnormally rigid.

Tests depend on a comparison of several tonometer readings, and drawing conclusions for the difference rather than the actual theoretical values, so that the above disadvantages are to a certain extent eliminated, provided one only compares readings taken with the same instrument.

The normal human intra-ocular pressure lies between 20 and 25 mm. Hg. with extremes of 11.5 to 30 mm. Hg. and the pressure should be approximately equal in both eyes. There is also usually a slight diurnal variation (3 or 4 mm. Hg.), the tension being highest on awaking in the morning and falling throughout the day. For glaucoma to exist the intra-ocular tension must be raised above the normal level of 30 mm. Hg.

The glaucomatous eye follows the normal diurnal variations (Langley and Swanljung 1951) but the system becomes less stable so that the swings become exaggerated. A tension variation of more than 6 mm. Hg. during 24 hours is very suspicious and often considerably greater differences are encountered. When the tension of the two eyes at any given time shows a difference of more than 5 mm. Hg. it is very suggestive of glaucoma.

The Early Diagnosis of Glaucoma. G. P. Sourdille. *Transactions of the Ophthalmological Society of the United Kingdom.* Vol. 76, p. 33. 1956.

The author limits this report to a discussion of the improvement made possible by electric tonography in the early diagnosis of certain obscure types of glaucoma: The type arising in a myope; the type associated with a cataract; and some varieties of low pressure glaucoma where the operative indications are uncertain.

Up to 1954 the visual field changes were, in the author's opinion, the most important guide to a diagnosis of glaucoma. Among these changes contraction of the peripheral visual field was the most compelling operative indication. Now on the basis of his own statistics he asserts that the develop-

ment of many paracentral scotomas, since they are connected with vascular lesions of the nerve itself, is not stopped by the operation, and presents a significant contraindication to surgery.

He concedes an equal value to resistance measurements as well in the diagnosis as in the operative indications of primary glaucoma. Steady rise in the outflow resistance corroborates the diagnosis of glaucoma and constitutes an essential operative indication in every form of primary glaucoma.

In the author's opinion resistance measurements should be taken in every case of low pressure glaucoma. Perhaps their systematic use will allow a distinction to be made between two different types of the disease: First, "Von Graefe's simple atrophy" induced by vascular lesions in the optic nerve and the surrounding part of the chorioretina. In this type the level of resistance is normal and surgery is useless. Second, a true glaucoma where increased resistance, cupping of the disc, and peripheral narrowing of the field are present.

The Fellow Eye in Acute Closed-Angle Glaucoma. W. E. S. Bain. *British Journal of Ophthalmology.* Vol. 41, p. 193. April 1957.

Two hundred patients who had suffered an attack of acute closed-angle glaucoma were examined to discover the fate of the fellow eye. Excluding seven cases who had undergone a prophylactic operation, 53 per cent developed symptoms in the other eye. In 35 per cent the symptoms comprised another acute attack.

There was no significant difference in the time taken to develop trouble in the second eye between patients treated with miotics and those who had no treatment. The second eye became involved after an average interval of four to 25 years, regardless of treatment.

The author recommends the application of provocative tests to the second eye even when apparently clinically normal. The tests also help in assessing whether a manifest chronic closed-angle glaucoma may be partially controlled by a miotic at any given time. He also suggests a peripheral iridectomy in younger patients and in those whose occupation takes them away from medical surveillance for long periods. In his opinion this operation is subject to fewer complications than any other glaucoma procedure.

Studies of Outflow of Aqueous Humor. J. Francois and M. Rabaey. *Transactions of the Ophthalmological Society of Australia.* Vol. 16, p. 51. 1956.

Perfusion of enucleated eyes offers an interesting possibility of investigation. The technique used in this study of 62 rabbit eyes and 67 human eyes is described.

A needle is introduced into the anterior chamber through the cornea; the needle is connected with a system by which the perfusion fluid is kept under constant pressure. The quantity of fluid entering the anterior chamber is read from a graduated pipette containing a meniscus. The perfusion fluid is a physiological serum buffered with 10 per cent phosphate solution.

The great advantages of these experiments, the authors claim, lie in the fact that the results are independent of various circulatory and nervous variables such as are of importance in

the living organism. The values obtained by perfusion *in vitro* correspond surprisingly well with those obtained by tonography.

The rate of outflow obtained by perfusion of human eyes is the same as that obtained by clinical tonography, and is directly proportional to the depth of the anterior chamber. This factor of the chamber depth should be considered as much in the clinical tonography as in the experimental perfusion value.

Addition of India ink to the perfusion fluid and subsequent histological examination showed that the perfusion fluid leaves the eye past the angle of the trabeculum, the canal of Schlemm and the intrascleral venous plexus. In human eyes part of the India ink is also diffused in the iris and the ciliary body.

In another test, further addition of hyaluronidase, an enzyme, to the perfusion fluid showed a much slighter and more variable effect on the outflow in human eyes than in rabbit eyes.

Glaucoma Detection in a General Hospital. J. W. Smillie, F. D. Roth, F. Blum and L. K. Gates. *American Journal of Ophthalmology.* Vol. 44, p. 20. July 1957.

A survey of 1,054 nearly consecutive admissions of patients over the age of 40 to the Ann Arbor Veterans Administration Hospital revealed a 0.76 per cent incidence of previously unknown cases of chronic primary glaucoma.

Intraocular pressures were taken with the standard Schiøtz tonometer, usually with a 7.5 gm. weight. Ten known cases of glaucoma and 55 new suspects with tensions of 25 mm. Hg. and over in one or both eyes were noted. Further tonometries on 47 of these eliminated 22 patients as having normal tensions and no glaucoma. The others were subjected to visual field studies, water drinking tests, dilated tensions and gonioscopy.

There were 18 cases of glaucoma among the 1,054 patients. Of the ten known cases, three were chronic open-angle, two secondary, one acute closed-angle, and four absolute glaucoma from an old injury. The eight new cases comprised seven chronic open-angle and one chronic closed-angle. None of these eight had yet lost central visual acuity, though two already had field changes near the fixation point. Two had a definite family history of glaucoma.

The seven open-angle cases have all been controlled by miotic therapy and the closed-angle case with peripheral iridectomies.

Corneo-Scleral Tonography. T. H. Hodgson and R. K. MacDonald. *British Journal of Ophthalmology.* Vol. 41, p. 301. May 1957.

Corneo-scleral tonography, using the Mueller electronic tonometer in a method causing a minimum of discomfort to patients, is a practical, accurate and easily standardized test in the diagnosis of glaucoma. It yields valuable information, particularly with regard to borderline cases.

It has been known for many years that pressure exerted on the eyeball causes a lowering of ocular tension. In the investigation reported the results of both corneal and corneo-scleral tonography demonstrated a lowering effect on the intra-ocular pressure.

The authors described these methods in detail. In their series corneal tonography was done for comparison.

The results of corneal tonography demonstrated a certain degree of overlapping between normal and glaucomatous eyes, though a line could be drawn which for the most part separated normal cases from cases of glaucoma. On the other hand, with corneo-scleral tonography, the general lowering effect was less than that observed with corneal tonography, and there was much less overlapping of results between normal and glaucomatous eyes. The dividing line between the two groups is, however, almost parallel to that found with corneal tonography.

Cases of closed-angle glaucoma, even in interval stages, fall within the glaucomatous group. Cases of moderate to severe loss of field, even in true low pressure glaucoma, also fall within the glaucomatous group.

Diurnal Changes in Eosinophile Count: Comparison with Changes in Intraocular Pressure, Tonographic Values, and Aqueous Veins. A. Cambiaggi, W. M. Spurgeon and R. Spurgeon. *A.M.A. Archives of Ophthalmology*, Vol. 55, p. 765. June 1956.

An investigation was made to determine whether a correlation existed between intraocular pressure and eosinophile count in chronic simple glaucoma, and between these factors and the appearance of the aqueous veins. The aim was to evaluate Stepanik's theory that the pituitary directly influences intraocular pressure. The U.S. Public Health Service and the National Society for the Prevention of Blindness made grants in aid of this study.

Tonometric readings and eosinophile counts were made every two hours through the day on 21 patients with chronic simple glaucoma (35 affected eyes). Observation of the aqueous veins was made before tonography. As control 14 normal eyes were similarly studied.

None of the normal subjects showed a relation between eosinophile count and intraocular pressure. Of the glaucomatous subjects five showed a high negative correlation (−0.79), and the others showed a positive correlation coefficient not significantly different from zero (+0.031). None of the normal subjects showed a relation between the appearance of the aqueous veins and eosinophile count or intraocular pressure, but such a relation was found in six of the 30 glaucomatous eyes in which it was possible to observe the aqueous veins.

The possible existence of a special type of chronic simple glaucoma is suggested by the fact that these subjects fell into two groups. In the five showing a high correlation between intraocular pressure and eosinophile count it may be that the diencephalon-hypophysis region influenced intraocular pressure by some unknown mechanism.

An Experimental Clinical Evaluation of Dorsacaine Hydrochloride (Benoxinate Novesine). Report on the Instillation of a 0.4-per cent Solution. Richard Emmerich, G. Z. Carter, and C. Berens. *American Journal of Ophthalmology*, Vol. 40, p. 841. December 1955.

A clinical evaluation was made of dorsacaine, a new compound developed in Switzerland, as a surface anesthetic in comparison with pontocaine. The series included 408 unselected patients from the glaucoma and emergency clinics of the New

York Eye and Ear Infirmary. Each patient received one drop of dorsacaine (0.4 per cent) in the right eye and one drop of pontocaine (0.5 per cent) in the left eye. The subjective reactions of the patients showed that dorsacaine produced significantly less irritation than pontocaine.

Other advantages of the new anesthetic were that it worked more rapidly than pontocaine, and produced much less hyperemia. Neither drug had systemic toxic effects. For mass glaucoma screening, dorsacaine may prove valuable. Instilling saline in the eye to be tested shortens the duration of anesthesia. The new plastic dropper bottle releases a very small drop of the 0.4 per cent solution which is sufficient for tonometry. Dorsacaine was evaluated as a local anesthetic for various minor operative procedures. Two drops were used for gonioscopy, and two or three for removing foreign bodies or probing lacrimal ducts. Excision of chalazia required six to 10 instillations.

Biochemical Studies of Cataract. V. Biochemical Genesis of Senile Cataract. S. Ogino and T. Ichihara. *American Journal of Ophthalmology*. Vol. 43, p. 754. May 1957.

A cataractogenic substance is excreted in the urine of patients with senile cataract, but it is not found in that of normal persons.

The authors describe studies demonstrating that this cataractogenic substance is extractable with ether under acidified conditions and can be precipitated with Hopkins-Cole's solution as mercuric compounds, but it is not precipitable with lead acetate and lead vinegar.

Anthranilic acid and 5-hydroxyanthranilic acid are detectable by paper chromatography from the fraction precipitated with Hopkins-Cole's solution.

In crystalline form, 5-hydroxyanthranilic acid and anthranilic acid can be isolated from the urine of cataractous patients.

Scorbutic guinea pigs developed cataract following injection of quinonimine-carboxylic acid prepared from 5-hydroxyanthranilic acid by bromine.

The relationship between the development of senile cataract and the metabolism of tryptophane is discussed.

Diagnostic Value of Radioactive Phosphorus. T. M. Evans. *The Pennsylvania Medical Journal*, Vol. 59, p. 574. May 1956.

Diagnosis of borderline cases of intraocular tumor and retinal detachment may be helped to some extent by the use of radioactive phosphorus. In a series of 37 cases in the Pittsburgh Eye and Ear Infirmary the increased uptake of P_{32} by the involved eye confirmed the final diagnosis in 22 instances, or 68 per cent.

In 13 cases of intraocular tumor independently diagnosed by pathologic examination the phosphorus test was confirmed in lesions of the anterior segment. However, in the 10 cases of posterior segment lesions the test was correct in only five. A second group of 17 cases of retinal detachment was correctly diagnosed by P_{32} only about half the time. In five cases of chorioretinitis P_{32} localization gave an accurate indication of the absence of tumor in three cases.

Possibly future work may increase the usefulness of radioisotopes in ocular diagnosis.

Some Problems in Relation to Retinal Detachment. J. M. McLean. *Eye Digest.* Vol. 1, p. 18. January 1957.

Since Gonin clarified the cardinal principles of detached retina thirty years ago, developments in techniques have been many. The basic principles of treatment have remained the same: find and localize all the breaks in continuity of the retina, close these holes, secure reapposition of retina and choroid by removal of subretinal fluid.

Direct ophthalmoscopy has been popular in this country but it has had its limitations. Many of the detachment-producing retinal breaks were located too far forward to be reached by this technique. Some were not accessible even to indirect approach. Localization of the retinal tears has gone through a cycle: today the trend is back to indirect ophthalmoscopy with the distinct improvement made by Schepens' addition of stereoscopic visualization, rediscovery of scleral depression for viewing the most peripheral lesions and exact localization under ophthalmoscopic observation during surgical procedure.

Every conceivable method of tissue repair has been attempted, the most popular having been the numerous techniques using direct current (electrolysis) or high frequency alternating current (diathermy). In future through use of modern electronic know-how the design of machines and electrodes can undoubtedly be improved as well as the understanding of various techniques.

Reapposition of retina and choroid often presents problems; if on bed rest the retina settles back into its place this may suffice to seal the holes. When reapposition must be forced, the approach is through (1) various methods of diminishing subretinal fluid or increasing preretinal bulk, or a combination of the two; (2) various types of scleral shortening or infolding with or without insertion of foreign material into or under sclera or choroid.

Retinal Detachment among Filipinos. N. C. Legasto and M. C. Legasto. *The Journal of the Philippine Medical Association.* Vol. 32, p. 764. December 1956.

Surveys made by the authors and other ophthalmologists show that the incidence of retinal detachment among Filipinos is much lower than in other countries. Whether an increase of pigment in the retina or fewer vascular diseases are responsible is not known.

Eight cases of retinal separation are described. Surgical intervention was indicated in every case and localization of tears, drainage of subretinal fluid and application of diathermy pins were the preferred operative procedures. Treatment was successful in all except one of the patients.

Etiology and Pathogenesis of Retinal Detachment. L. Sanchez Bulnes. *Ophthalmologica Ibero Americana.* Vol. 19, p. 68. First Quarter 1957.

Retinal detachment starts with degenerative retinal or chorio-retinal circumscribed lesions. The symptomatology goes unnoticed until the anatomic separation of the retina from its choroidal bed is apparent. The cause of the disease is not known. It appears to be more prevalent among the Jewish race; is more frequently observed between the ages 10 and 60; is not truly hereditary. It is predominant among males but probably this should be related to professional causes.

The part played by trauma in the history of retinal detachment is accepted universally. Discounting perforating wounds, Leber believes 16 to 18 per cent of the total number of cases to be traumatic detachments; Stallard gives the same percentage, Shapland 26 per cent, Dunnington and Macnie and others put it at 30 per cent.

The influence of myopia upon retinal detachment is generally accepted; it is most common in moderate myopes (8 to 15 diopters). Anterior chorioretinal lesions in myopic eyes and in those with senile changes are frequently observed in these patients, also chronic or subacute inflammatory processes of the uvea and changes in the vitreous.

In spite of advancing pathogenic knowledge, speculation in old theories of distention, exudation, traction and hypotony still persists. The author discusses these in the light of current knowledge and treatment.

The Complete Elimination of Retrolental Fibroplasia. J. C. Locke and P. Banister. *The Canadian Medical Association Journal.* Vol. 76, p. 81. 1957.

The authors emphasize that in spite of wide publicity given to the findings that excessive oxygen administration to premature infants leads to retrolental fibroplasia, the disease still occurs. They report a program in which it has been completely eliminated from a group of 126 premature infants weighing four pounds or less at birth.

The infants were given oxygen only for resuscitation or because of respiratory difficulty, cyanosis, pallor and lethargy after oxygen cessation. Only in a few cases was a concentration of 40 per cent oxygen exceeded. No cases with even the mildest manifestations of the disease occurred. There was no increase in the mortality rate and there were no adverse effects on the children's general development.

Suggestions for preventive public health measures and general recommendations for the control of oxygen therapy are given. The authors believe that retrolental fibroplasia is completely preventable.

The Role of Oxygen in Retrolental Fibroplasia. A. Patz. *Pediatrics.* Vol. 19, p. 504. March 1957.

In this E. Mead Johnson Award address, presented before the American Academy of Pediatrics, Dr. Patz reviews the studies which established overuse of oxygen as the principal factor in the development of retrolental fibroplasia.

There is a brief discussion of exceptionally rare cases of the disease occurring without use of supplemental oxygen. The author points out that these may be related to factors, yet unrecognized, that can alter normal growth of the immature retinal vasculature which in the premature infant matures *ex-utero* in contrast to its normal intrauterine environment.

Dr. Patz points out that while oxygen saturation of arterial blood is approximately 50 per cent *in utero*, after birth arterial saturation rises while in room air without added oxygen to approximately 90 per cent. Retinal vasoconstriction might, theoretically, develop in a premature infant from this rapid increase in oxygen tension, and could explain an occasional case of retrolental fibroplasia developing in a sensitive retina where this relative

increase in oxygen tension caused vasoconstriction and ultimate vasoproliferation.

The occurrence of an occasional case of typical retrolental fibroplasia in a full-term infant challenges the validity of the fundamental assumption that only the immaturely vascularized retina is susceptible to the disease. A significant variation in stage of retinal vessel growth for a given age animal of the same litter was noted in the laboratory on several occasions. It is reasonable to assume that an occasional full-term infant would have a small zone of anterior retina still incompletely vascularized. This assumption is supported by the actual observation of an incompletely vascularized retina in cross-sections of two full-term, apparently normal eyes. The greater predilection for retrolental fibroplasia to involve the temporal quadrant of the retina also supports the basic premise of oxygen susceptibility of only retinal immature vessels, as the anterior zone of the temporal retina is the last portion of the human retina to become completely vascularized.

Retinopathy of Prematurity (Retrolental Fibroplasia) in Children in Whom the Disease Has not Progressed to Complete Blindness and the Subsequent Investigation of Cases of Myopia. I. D. R. Gregory. *British Journal of Ophthalmology.* Vol. 41, p. 321, June 1957.

Investigation of association of prematurity with ocular and other defects has shown a higher incidence of low visual acuity, with less hypermetropia and more myopia, than observed in full-term infants. In addition to the ocular findings, the greatest difference between the full-term child and the prematurely born was seen in the higher incidence of feeble-mindedness and an increased tendency to nervous disorders and speech defects.

The current study comprised the findings in 30 children who were known to have had retrolental fibroplasia and in whom some degree of vision could be expected. Myopia, varying from −2.5 to −18 D., was present in 85 per cent and almost half of all the cases with useful vision showed nystagmus. Seventeen children had strabismus and 14 others unilateral microphthalmus. Also noted were opacities in the ocular media, 14 malformations of the optic nervehead and thinning, atrophy and depigmentation of the retina. Retinal detachment was evident in 14 children and five others had retinal folds.

During the examination of certain cases of myopia occurring in children of school age it became apparent that the clinical picture, which in several cases had been accepted as consistent with the appearance of congenital myopia, resembled that found in the abortive cases of retrolental fibroplasia. Subsequent inquiry revealed that all of these children had been born prematurely.

It is suggested that the association of the retinopathy of prematurity with myopia is a real one, and that prematurity is one of the factors in the causation of myopia.

An Apparatus for Grading the Visual Acuity of Infants on the Basis of Opticokinetic Nystagmus. J. J. Gorman, D. G. Cogan and S. S. Gellis. *Pediatrics.* Vol. 19, p. 1088. June 1957.

Most reports concerning the age at which infants are able to follow moving objects have been casual observa-

tions on individual children. Since present knowledge of this visual function is limited to estimates based on methods of rather questionable accuracy, an apparatus for the purpose of grading the visual acuity of infants by means of opticokinetic response was devised.

The equipment consists of a strip of rolled white paper 16 feet long and nine inches wide. Across the width of the paper black lines are printed which are equidistant and of the same thickness as the intervening white spaces. The first eight feet are printed with a .02 inch pattern, the second eight with a .06 inch pattern. The whole strip is reeled manually from one spool to another over two narrow plexiglas arcs, forming a tent-like affair under which the child is placed.

The distance from the infant's eyes to any point on the arc of paper is approximately six inches and corresponds to a Snellen notation of 20/60. Two small 25-watt floodlights placed back of the baby's head are beamed upward and supply fairly even illumination. The spools have a gear ratio which moves the paper along at approximately 0.9 ± 0.2 inches when the handle of the working spool is turned as slowly as is consistent with smooth rotation. This amounts to an angular velocity of approximately 8.5 degrees/seconds.

In the present study 93 of 100 newborn infants one-and-a-half hours to five days old showed positive responses to the pattern: 52 excellent, 31 good, 10 fair. The seven others were negative.

The apparatus is said to be useful not only for determining visual acuity but in determining the presence or absence of vision. While a lack of response is not final proof of blindness, a positive response definitely indicates the presence of vision.

This study was supported by a grant from the National Society for the Prevention of Blindness.

A New Picture Series for Preschool Vision Testing. H. F. Allen. *American Journal of Ophthalmology.* Vol. 44, p. 38. July 1957.

Early vision testing has received increasing recognition as the key to amblyopia prevention. The high incidence of this condition indicates the need for testing preschool children three years old and older. Ophthalmologists have a responsibility for educating the public and medical profession in this respect.

Because of extraocular influences results of acuity testing in young children must be regarded merely as minimum values. Unsatisfactory tests should be repeated at monthly intervals, until definite results are obtained.

The symbol E chart is recommended as the most useful test for children who can comprehend it. However, there are many children who cannot, and for them a new picture test was devised. Eight pictures were selected from a much larger series as a result of their interest value for preschool children and the consistence of their recognition distances. The recognition facility of these pictures was made to correspond as closely as possible with that of the 30-foot E.

Extensive trials have shown that these pictures can be recognized at 15 feet by normal three-year-olds and at distances up to 20 feet by four-year-old children. Differences of even one line in Snellen acuity are reflected in corresponding shortening of recogni-

tion distances. The subject matter, the construction of the drawings, their presentation individually, and their correlation with known acuity levels are considered to represent improvements over picture charts now in use.

Congenital Defects in Infants Following Mumps During Pregnancy. A Review of the Literature and a Report of Chorioretinitis due to Fetal Infection. J. Holowach, D. L. Thurston and B. Becker. *The Journal of Pediatrics*. Vol. 50, p. 689. June 1957.

Mumps virus infection in early pregnancy can affect the fetus adversely. A case of congenital chorioretinitis is attributed to such infection. The patient was first seen at six months of age because, as her mother put it, "she doesn't see like she should." Physical examination was normal but the maternal history revealed bilateral parotid swelling (mumps) in the fourth month of pregnancy. Ophthalmological examination of the infant showed a searching type of nystagmus. Lids, lacrimal apparatus, conjunctiva, cornea, sclera and tension in both eyes were normal. There was an exotropia of 15 degrees, pupils reacted sluggishly to light and both discs were markedly atrophic. The left optic disc was about one-half the size of the right. Atrophic scars with peripheral pigmentation were seen in the region of the maculas of both eyes and an additional area of atrophy was present between the disc and the macula of the left eye. There was also a peculiar mottling of the entire fundus bilaterally. Tests for toxoplasmosis antibodies were negative.

A review of reported noxious results of maternal mumps during gestation reveals several cases of spontaneous abortion, stillbirth, and congenital abnormality.

The authors recommend that in cases of congenital defects following maternal mumps, complement fixation and skin testing should be performed on these infants (after two months of age) to establish this causal relationship.

Incidence of Defects of Visual Function in Children and Adults. A. Sorsby, B. Benjamin and J. Yudkin. *British Journal of Preventive and Social Medicine*. Vol. 19, No. 1. January 1955.

The functions of vision—central visual acuity, accommodation, convergence, muscle balance, binocular vision, color vision and dark adaptation—were tested in 654 children, age 12 to 14 years, and in 501 men age 21 to 40 years. Hemoglobin determination was done on all children. Conventional criteria for normality were adopted.

In the children 74.9 per cent were found to have normal visual acuity, but only 52.1 per cent were normal in all respects. In adults the respective percentages were 64.1 and 28.8 per cent. In both groups the incidence of defects other than those of visual acuity was considerably higher in those whose central vision was subnormal. Except for color and stereoscopic vision the incidence of anomalies was found to increase markedly with age.

The functional significance of the relatively unconsidered anomalies, especially those of muscle balance and stereoscopic vision, and whether these anomalies are remediable, remains to be assessed.

There is no case for extending the routine medical examination at school

to cover visual functions other than central acuity. There is a case for assessing specific visual functions for specific tasks. The requirements of specific industries need to be established. Only a few have any clear criteria, though there is much to suggest that industrial efficiency and individual contentment call for such requirements to be clearly known.

Follow-up of the school children after five years offered no suggestion that anomalies in visual functions had significantly affected their careers. Owing to the number of occupations involved it was not possible to relate this inquiry to specific occupations.

A Plea for Preschool Eye Care. R. T. Blackhurst. *The Journal of the Michigan State Medical Society.* Vol. 56, p. 336. March 1957.

School vision programs refer an alarming number of partially sighted young Americans to general practitioners, pediatricians and ophthalmologists. In most cases, the author states, this loss of sight could have been prevented.

The problem appears to be one of universal ignorance of growth and development of vision. Even the most conscientious parents have only limited knowledge about it, and most of them feel secure in waiting until a child reaches school age before having the initial eye examination.

The problem is twofold; it involves detection of poorly aligned eyes, and those which have optical defects. One of the two distinct types of vision, the peripheral, is present at birth and develops shortly thereafter. Central vision develops slowly and gradually throughout the first six years of life. It is peripheral vision that permits an infant to follow light and moving objects and later walk without bumping into things.

Central vision develops slowly; young infants have no ability to fixate. This essential of binocular vision and stereopsis is developed in young eyes only by constant repetition of the process of observing, studying and concentrating on small objects, shapes and outlines.

Amblyopia, the gradual loss of useful central vision, may be corrected if discovered early. Once a child has reached the age of seven or eight years it is seldom possible to restore lost central vision. The reflex pattern which has been set soon becomes fixed. Whether amblyopia is due to an optically defective or crossed eye, early treatment consisting of corrective glasses, surgery or occlusion of the better eye usually remedies the situation.

Visual Acuity. M. J. Hirsch. *American Journal of Optometry and Archives of American Academy of Optometry.* Vol. 32, p. 209. April 1957.

It is sometimes claimed that the stereoscopic method of testing visual acuity is superior to the Snellen test because in the former both eyes are open and presumably seeing, and that is thought to be the more normal condition. The author contends that this statement is untrue.

In the Snellen test the eye being measured for acuity views a test pattern where both the periphery and the central area are presented, while a blank field is presented to the occluded fellow eye.

The author believes that in stereoscopic testing, the central area of the eye being tested is stimulated by the test pattern while the corresponding

area of the fellow eye is stimulated by a white space. These two stimuli, being dissimilar, cannot be fused. On the other hand, the stimuli presented peripherally are similar and can be fused. The task, then, which is set for the observer is to fuse two objects peripherally and to identify simultaneously a test pattern centrally with one eye. That the task is one of which the human visual mechanism is capable is readily attested by a large number of patients tested in this manner. This is not a natural situation, because at no time in his natural life can the individual possibly be called upon to view objects in this manner. Factors other than acuity enter into such a test situation. An individual who found it difficult to fuse peripherally while ignoring the central clear space before the eye not under test would do poorly on the test. Thus, one skill, acuity, is being pitted against another, namely central suppression or the ignoring of the white central field.

Stereoscopic testing of acuity may have advantages over the customary Snellen test, the author states, but he refutes the claim that one such advantage is the naturalness of the conditions of testing. He emphasizes the complexity of acuity measurements, and other factors and skills involved in whatever the method of stimulus presentation.

Étude sur la Cécité dans le Sud-Tunisien. F. Malnou. *Journal D'Ophtalmologie Sociale.* No. 17, p. 9. 1956.

A campaign is under way to improve eye conditions among the people of South Tunisia.

A recent census in the region of Djerid shows about one per cent of the population over 40 years of age to be sightless, women outnumbering men almost two to one. Tradition in these regions frowns upon women assembling in public to undergo examinations and the author assumes that the number would be doubled if all blind women in the region were known.

Acute complicated conjunctivitis was found to be responsible for 41 per cent of bilateral blindness; 89 per cent in one eye only. Glaucoma accounted for 35 per cent of bilateral blindness.

A treatment program includes application of antibiotics distributed through dispensaries, prophylaxis on newborn, screening and examination of school children.

Lens Materials and the Prevention of Eye Injuries. A. H. Keeney. *Transactions of the American Ophthalmological Society.* Vol. 54, p. 521. 1956.

Both industrial and semi-ophthalmic thickness types of heat-treated glass are easily available at practically no greater cost than conventional glass, and are being more widely used for children and individuals in only occasionally hazardous occupations. Present developments in optical plastics have far surpassed the disappointing false starts made with xylonite and methyl methacrylate, which were impractically soft and subject to discoloration. The major drawback to plastic lens materials is that they are still softer than glass, but considerable strides have been made in modifying this characteristic.

Useful and relatively hard, thermostable, plastic lenses are now available, with excellent optical characteristics and high safety values. These allyl type resin lenses are of light weight, have an improved resistance to chem-

icals and a reduced tendency to fogging, and pit less than glass on exposure to welders' splatter.

All prescriptions for spectacles and goggles should designate the type or treatment of lens material to be used, in an effort to increase mechanical safety and protection. The patient's age, occupation, prescription strength, and economic status should be considered. In lenses of minus cylindrical strength, industrial thicknesses of heat-treated glass or allyl resin lenses should be employed, but more suitable thin materials may be ordered for other dioptric ranges.

These safer lens materials should progressively replace hazardous and indiscriminate use of crown glass.

Ocular Injury from Electric Current and Lightning Flash. M. C. Moore. *Transactions of the Ophthalmological Society of Australia.* Vol. 16, p. 87. 1956.

Passage of an electric current through the body, as in lightning stroke or from domestic or commercial source, can cause a wide range of ocular injuries, varying from minor visual disturbances to opacification of the lens and complete incineration. Visual defect without such obvious pathological change as lens opacity may occur. Relative or absolute central scotoma, ring scotoma and concentric contraction of the visual fields have been described.

The author cites three cases in which patients who had suffered electric shock showed partial ring scotoma.

Reports of similar ocular defects from exposure to lightning flash are rare, but they have been described by Brière in 1876, Oliver in 1896, and Yarr in 1901. Busacca in 1948 described a bilateral macular lesion caused by lightning. Edema, a small area of detachment, exudation and a small lesion surrounding the fovea were present. Similar intensive flashes from short-circuiting high tension currents and electric welding have been described.

The author lists four cases in which eye injury was in his opinion due to absorption of radiant energy from lightning flash, not to the passage of electric current, as the patients apparently were not struck. In one instance a man was walking along a street carrying a child in his arms when lightning struck a post at his side. For fifteen minutes he was unable to see, and while the vision of his right eye later became normal, that of the left never reached 6/60. Perimetry showed a left central scotoma, but the fundi were normal except for a small white spot just below the left macula. Pupils were equal and active.

Eye Armor. J. R. Fair. *American Journal of Ophthalmology.* Vol. 43, p. 258. February 1957.

World War II and the Korean conflict saw increasing use of the fragmentation type of explosive weapons, with corresponding increase in eye wounds. Hundreds of soldiers were blinded by tiny particles of flying metal and secondary missiles of earth and sand thrown up by explosions. Thousands more lost a single eye. The impossibility of restoring useful vision in the greater proportion of these cases indicated that by far the best treatment would be complete prevention.

The use of eye armor for American combat troops, similar to protective eyewear used in industry, has been

considered for many years. Until recently any concept of such a protective device for soldiers included its ability to withstand impact of high-velocity, large-caliber missiles. In Korea, however, the great proportion of eye wounds were produced by small particles no larger than the bits of metal against which the industrial worker is so effectively protected.

The author suggests that spectacle-type goggles with side-shields would be most suitable for combat soldiers. Instructions in the use of this eye armor should be given during basic training. Case-hardened glass lenses meeting Federal specifications are recommended rather than plastic, because the latter scratch easily. Provision of equipment for replacing eye armor, particularly where corrective lenses are involved, might pose a problem in forward areas, but such a unit would save manpower.

The Division of Labor Between Optometry and Ophthalmology. Glenn A. Fry, Ph.D. *American Journal of Optometry*. Vol. 34, p. 150. March 1957.

This paper by the dean of optometry at Ohio State University discusses his personal opinion about how optometry and ophthalmology ought to be interrelated. He feels that optometrists should not seek to use drugs in the diagnosis of eye conditions, although he recognizes that the medical profession has certain advantages in their use. However, he feels that it is easier to define standards for the practice of optometry and for interprofessional relationship if the line is drawn at the use of drugs.

Dr. Fry feels that the laws ought to make an optometrist legally accountable for failure to refer a patient for medical care, just as the medical practitioner is legally accountable for exercising reasonable care. He feels that it is unfortunate if a person takes advantage of his medical license to earn his living primarily by refracting eyes, without making a respectable effort to become qualified to practice the art. On the other hand, if the ophthalmologist specializes in eye diseases and makes a substantial contribution to the handling of eye diseases in his community, Dr. Fry feels that no optometrist can complain about his engaging in refraction.

Dr. Fry points out that the ophthalmologist must know something about refraction in order to treat eye diseases, and that it is necessary to spend part of his time doing refractions in order to maintain the necessary degree of proficiency. Dr. Fry speaks highly of the ability of ophthalmologists with whom he has been acquainted who have assisted in the instruction of optometrists in recognizing which patients need referral to ophthalmologists.

Study of the Apparently Normal Eye in Unilateral Simple Glaucoma. P. Matteucci. *Rass. Ital. d'Ottalmologia*, vol. XXV, p. 161, May-June, 1956.

The author followed the diurnal tonometric curve, angio-scotometry, pupillography and provocative tests in four cases of unilateral glaucoma. His studies led him to believe that diurnal tension curves and pupillography are the earliest changes in the "normal eye" and that the uveal membrane is the probable seat of the first functional lesions.

EUGENE M. BLAKE, M.D.

BOOKS AND PAMPHLETS

The Accident Syndrome. Morris S. Schulzinger, M.D. Charles C. Thomas, Springfield, Ill. 1956. 236 p. $6.50.

Some 35,000 consecutive accidental injuries recorded by a physician in general practice over a period of 18 years form the basis of this study. The records involve a somewhat stable population within which this physician medically served large numbers of industrial workers in nearby small plants, and at the same time gave them family care. The information was assembled solely for the purpose of good medical histories, but it lends itself in a unique way to statistical evaluation.

The author concludes that most accidents are solitary experiences of large numbers of individuals, while those who contribute disproportionate numbers of accidents are a shifting group. The young, the male and the maladjusted are the accident-makers, he finds, with unbridled, misdirected aggressiveness serving as a uniting common denominator. Ability readily to adjust to changes in environment is considered a major factor in accident prevention.

Among 2,267 patients treated for industrial accidents in the year 1947 there were 397 eye injuries. These were exceeded in frequency only by finger injuries. In a non-industrial group of 2,013 patients there were 262 eye injuries, exceeded only by those involving the fingers and face. The author believes that dealing with the individual through an integrated medical approach will further reduce the accident rate which has already been so favorably affected by preventive services and education.

Emmetropia and its Aberrations. Arnold Sorsby, B. Benjamin, J. B. Davey, M. Sheridan and J. M. Tanner. Medical Research Council. Her Majesty's Stationery Office, London. 1957. 69 p. 7s. 6d. net.

The biometric investigations on refraction that followed the pioneer work of Steiger at the beginning of the century are reviewed.

The present investigation into the optical components of refraction comprised a general study, in which the components of 341 different eyes were examined and compared; and a statistical analysis in which data on 194 of these eyes were subjected to detailed mathematical treatment. The chief object was to establish in detail the optical structure of the emmetropic eye, and to see how the values observed in the ametropic eye depart from those seen in emmetropia.

The essential findings were: None of the values of the optical components nor the axial length seen in emmetropia are exclusive to that of the refractive state. The powers of the cornea and of the lens observed in emmetropia, as also the values for axial length, show a wide variation (with normal distribution) and the same powers and values were observed in ametropia up to ± 4.0 D. In the emmetropic eye the different powers are coordinated with the axial length, but there is no such coordination in ametropia of up to ± 4.0 D.

The lack of coordination in ametropia is the distinguishing feature of the ametropic eye, just as coordination is the distinguishing feature of the emmetropic eye. Coordination, and the lack of it, rather than normal and abnormal components, are the characteristics of emmetropia and ametropia. Abnormal components—essentially abnormal axial length—came into play with the high refractive errors, and these constituted probably not more than five per cent of the refractions seen in the general population.

These findings suggest that the eye keeps on growing throughout late childhood. The eye becomes myopic not because the rate of growth of axial length is abnormal but because the process of growth changes in the cornea and lens have not kept pace with axial elongation.

The authors conclude that further studies are needed on both the growth of the eye and the inheritance of refraction.

The Visual Field. A Textbook and Atlas of Clinical Perimetry. David O. Harrington, M.D. C. V. Mosby Company, St. Louis. 1956. 328 p. $16.00.

This clinical guide, designed for the student and busy practitioner, is based on the author's 20 years' experience in teaching perimetry to graduate students of ophthalmology, neurosurgery and neurology. No perimetrist, he believes, should use exactly the same technique of examination on every patient. Responses will differ depending on age, speed of comprehension, state of health, rapport with the examiner, and many other factors. Thus he deals with techniques in general terms as far as the conduct of the visual field examination is concerned, supplying the tools, an account of their construction, and the principles underlying their use. The man behind the perimeter, states Dr. Harrington, is more important than the equipment he uses, and elaborate machinery is unnecessary.

The first section of the book is devoted to the examination of the visual field, the second to the interpretation of defects. Illustrative material is abundantly supplied. Reproduction of color plates and other illustrations, typography and format are of high standard. An extensive bibliography is included.

The Year Book of the Eye, Ear, Nose and Throat. 1956–1957 Year Book Series. Edited by Derrick Vail, M.D., and John R. Lindsay, M.D. The Year Book Publishers, Chicago. 1957. 448 p. $7.00.

Following the usual plan of this series the current volume includes abstracts taken from journals received between October 1955 and September 1956. The section on The Eye, edited by Dr. Vail, reflects many of the advances in ophthalmic research and clinical practice during this period. He cites a clinical and statistical survey of uveitis by George Bennett (*Brit. G. Ophth.*, Dec. 1955) as of outstanding importance, since uveitis is one of the gravest and most frustrating problems in ophthalmology.

Among other important developments were a study of muscle spindles and other sensory endings in extrinsic eye muscles by Sybil Cooper, P. M. Daniel and D. Whitteridge (*Brain* 78:564–583, 1955); an 82-page monograph on so-called senile ex-foliation of anterior lens capsule by Olav Aga

Sunde (*Acta Ophth.* supp. 45, 1956); a discussion of the problems of homoplastic grafting as applied to the cornea by Stewart Duke-Elder (*J. Roy. Coll. Surgeons*, Edinburgh, March 1956); and a review of ocular wound healing with particular reference to cataract incision by John H. Dunnington (*Tr. Soc. U. Kingdom*, 75:137–171, 1955).

Dorland's Illustrated Medical Dictionary. 23rd Edition. W. B. Saunders Company, Philadelphia, 1957. 1,598 p. $12.50.

Thousands of new terms appear in the 23rd edition of this well-known reference book, in keeping with the rapid expansion of medical research and knowledge. Changing concepts or wider study have prompted the revision of many terms that appeared in previous editions.

A new feature is the introductory section on how to use the dictionary, which gives detailed information on arrangement of entries, pronunciation, plurals, abbreviations and etymology.

A table of Modern Drugs and Dosage prepared by Dr. Austin Smith lists the drugs currently accepted by the American Medical Association, classified according to their use and accompanied by a statement of the usual adult dose and route of administration. A section on Fundamentals of Medical Etymology by Lloyd W. Daly is also included.

Blindness in Children. Miriam Norris, Patricia J. Spaulding and Fern H. Brodie. The University of Chicago Press, Chicago. 1957. 173 p. $3.00.

Early in the history of retrolental fibroplasia, the blinding eye disease of prematures who receive excessive oxygen, it was believed by some that the condition was part of an encephalopathy because these children often appeared mentally defective.

An intensive five-year study at the University of Chicago clinics of 66 blind preschool children together with observations of 239 others is ably reported here. Eighty-five per cent of the 66 children were blind from RLF. In all cases the diagnosis of blindness was made before the child's first birthday, and in two-thirds before six months. One-fifth of the children were born of multiple births; all of these were premature. Eighteen per cent of the families had one child; 17 per cent, four or more. Socioeconomic status was very high for five per cent, high for 24 per cent, moderate for 38 per cent, low for 21 per cent, and very low for 12 per cent.

Psychologists administered 2,500 tests during the project, using adaptations of the Cattell Infant Intelligence Scale and the Kuhlmann Tests of Mental Development, the Interim Hayes-Binet Intelligence Scale for the Blind, and a rearrangement of the Maxfield-Fjeld Scale to measure social maturity. Skilled social workers arranged for the help of various community resources as needed, and helped in assessing such factors as the child's environment and his responses to it, family and other interrelationships as affected by blindness, social development, and opportunities for learning (believed essential to meet the stimulus need).

When the project staff found children who needed the kind of opportunities for development provided by a nursery school, it was decided to place them in a carefully selected regular neighborhood nursery school

rather than to have one solely for blind children. Most children in the project were so placed and generally were able to profit tremendously by such experience. At the same time having a blind child in the group proved to have advantages for both children and staff in the regular nursery school.

Structure and Function of the Eye. A Handbook for Nurses and Teachers. Florence G. Henderson, San Francisco State College. The Gutenberg Press, San Francisco, California. 1957. 67 p.

For more than 10 years Mrs. Florence G. Henderson has been in the field of teacher education at San Francisco State College. She has had long experience with partially seeing children in the public schools of Minnesota and California. In this handbook, which is used in her courses, she gives an excellent outline of information concerning structure of the eye, diseases of the eye, visual defects such as myopia, hyperopia, astigmatism and strabismus, and the school vision testing program. Several helpful diagrams are an aid to understanding of eye structure and the refractive problems discussed.

This handbook, which has been found so useful at San Francisco State College, is now available for teachers and supervisors of partially seeing children everywhere.

Special Education of Atypical Children in Maryland. Report of Committee Appointed by the Maryland State Board of Education, Baltimore. 1956. 60 p.

This pamphlet outlines the need to discover ways of educating atypical children, the kinds of exceptionality represented in the state, and the probable enrollment in the various areas.

All fields of exceptionality are covered in relation to present services and general policy to be followed. Strongly emphasized is the importance of educating these children as much as possible as other children are educated, and with other children. To facilitate this the values of the team approach in case-finding, placement, research and follow-up are discussed.

In the special area of the partially seeing the general recommendations include making a study of the needs in order to plan education commensurate with the sight level at which each child functions; seeing that the team findings and other pertinent information are made available to parents and family physicians; determining educational placement as a result of the findings and in conjunction with school administrators. Further recommendations: that the administrators develop the best possible program within the public schools; that a lending library of large-print books and other appropriate materials be made available through the state board of education; that the state board of education employ a consultant in the field of the visually handicapped to assist regular classroom teachers; that such service be extended to those children who, for some reason, must remain at home.

The chairman of the Subcommittee on the Visually Handicapped was Dr. Roy O. Scholz. Consultant service in the area of the partially seeing was received from the following representatives of the National Society for the Prevention of Blindness: Mrs. Amie L. Dennison, Mrs. Burnetta Downing and Franklin M. Foote, M.D.

No evidence was found that RLF is associated with a brain defect. It was concluded that when a child with RLF appears to be mentally retarded and there are no specific neurological findings, the retardation is probably related to social and environmental factors. It was felt that there are no special problems or "handicaps" which can be directly attributed to blindness; and that the freedom to use all his sensory modalities constructively and without restraint are basic to a blind child's optimum development, especially during the earliest months and years. Those who have felt that the problems of the blind are chiefly those projected on them by their sighted "friends" and families will find much to strengthen this conviction in the six interesting case histories that are given.

Itinerant Teaching Service for Blind Children. Proceedings of a National Work Session. American Foundation for the Blind, New York. Group Reports No. 5. April 1957. 106 p. $1.00.

This publication is a summary of the pooled thinking of members of a group called together in the summer of 1956 to explore itinerant teaching programs for blind children attending their local school systems. Functions of an itinerant teacher are considered, along with provision and distribution of equipment, educational placement and administration of the program.

A new definition of blindness for educational placement is suggested which it is believed reflects a description of the child as he functions in the educational program: "A child whose visual loss indicates that he can and should function in his total educational program chiefly through the use of the braille system, audio aids, and special equipment necessary for him to pursue his education effectively without the use of his residual vision."

The suggested new definition appears much better than that formerly used where the criterion was based on 20/200 visual acuity in the better eye after correction. This new definition complements that used for several years by the National Society for partially seeing children: "Children having a visual acuity of 20/70 or less in the better eye after the best possible correction, who can use vision as the chief channel of learning."

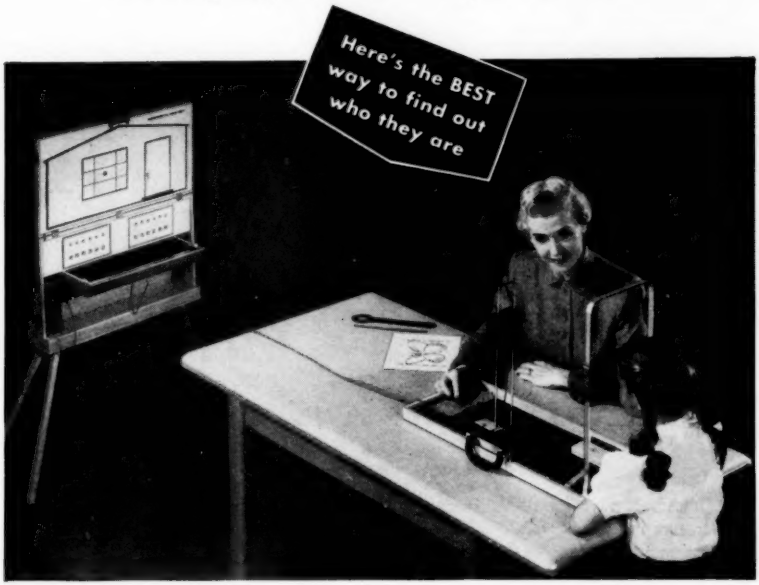
It is hoped that this new definition of blindness will encourage educators working with blind children to provide those whose visual acuity may be around 20/200 or 10/200 with several months' trial and encouragement in the use of large-print books, before coming to the conclusion that the child necessarily should learn braille. Children with even less visual acuity have been able to read large print through the use of magnifying lenses or other devices.

NEW PAMPHLET SERIES

The Public School Publishing Company of Bloomington, Illinois, has recently issued a series of five pamphlets on *Teaching Exceptional Children in Every Classroom.* They include "Challenging Gifted Children," by Jack W. Birch and Earl M. McWilliams; "Handwriting for Left-handed Children," by Luella Cole; "Reaching the Mentally Retarded," by Jack W. Birch and Godfrey D. Stevens; "Retrieving the Retarded Reader," by Jack W. Birch; and "Solving Problems of Problem Children," by Jack W. Birch and Edward H. Stullken.

One out of Five School Children

needs professional Eye Care...



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